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STEWART FASON  
PC SYSTEMS

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## NEWS

# IRS systems overdrawn

GAO estimates upcoming overhaul at \$3B to \$4B

BY MITCH RETTS  
CHIEF STAFF

WASHINGTON, D.C. — The single biggest management challenge facing the Internal Revenue Service is replacement of its aging computer systems for tax processing, the U.S. General Accounting Office (GAO) told a congressional hearing last week.

The report, by Sen. David Pryor (D-Ark.), who chaired the hearing to determine what the outdated IRS computer systems are headed for a "train wreck" in the mid-1990s.

The IRS, acknowledging that its 1960s-era systems are inefficient and will run out of capacity between 1992 and 1994, has launched a major replacement program called the Tax System Redesign. The GAO estimated the cost at between \$3 billion and \$4 billion.

Pryor questioned whether the IRS would be able to handle such a big project in light of audits showing poor financial controls and mistakes in other computer projects.

So far, the Tax System Redesign has been slow going, and the

date for full-scale implementation has slipped from 1995 to 1998, Pryor said.

"This modernization is a massive undertaking, even compared with many of the large systems we hear about in government and industry today," the GAO spokesman testified. The GAO suggested that one executive be given full-time responsibility for managing the technology overhauls and that the IRS retain the technical expertise of all its senior managers.

"IRS has preliminary design concepts," the GAO observed, "but the real work of modernization is still ahead." The design envisions a corporate database for widely used tax administration information, departmental systems for department-specific information, a nationwide network, electronic filing of tax returns and optical-disk storage.

The IRS wants the new systems to be portable, flexible and expandable. "Our current system is not one of those things," said Margaret O'Rourke, director of information systems design at the IRS office, at a conference last year.

# 1-2-3 Release 3.0 bound for 5,000 beta-test sites

BY DOUGLAS BARNEY  
CHIEF STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. launched what may be the largest beta test ever when it shipped out prerelease copies of 1-2-3 Release 3.0 last week.

The massive beta-test release is the first great news for the firm since it was besieged by product delays and criticized by an increasingly skittish user base. Since early last year, Lotus' image as a technology leader has been harmed by unfounded promises. This could change with a warm Release 3.0 reception.

Barring unforeseen bugs, the product — announced 23 months ago — should make its June 1989 deadline. Lotus and its 5,000 corporate testers now have three months to test, debug and shrink-wrap the long-awaited upgrade.

Despite some user defections and growing user anger, Lotus' fate remains a little bit iffy. But there are so familiar with 1-2-3 that switching to another product would be like getting a divorce, said Ross Goldfarb, a new-technology evaluator at Frost & Whitney.

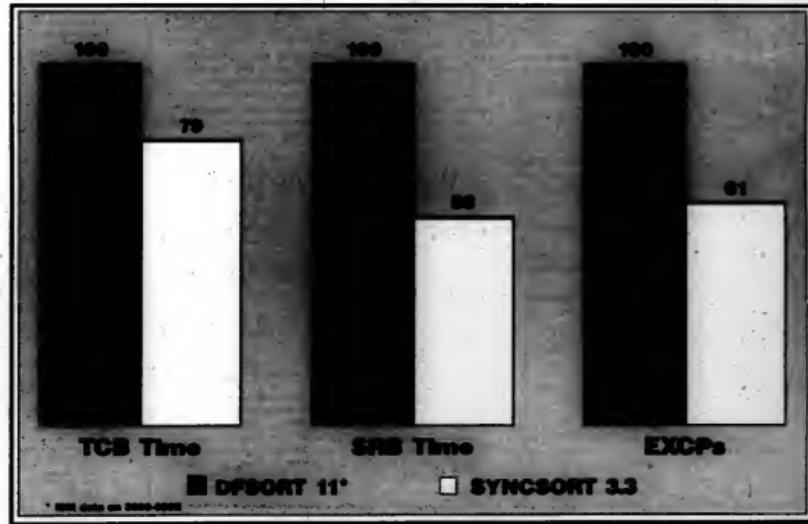
Lotus has forked millions in upgrade fees to hang onto users. The firm has been offering a free upgrade to Release 3.0 for all Release 2.01 purchases since September 1988.

Like General Motors Corp. putting cars on the showroom floor but refusing to open the hood, Lotus is still providing scant Release 3.0 details such as the number of features required to run the product. However, industry sources and a Lotus insider concur that the MS-DOS version will require a so-called DOS Extender and will not run on Intel Corp. 8088-based machines. Lotus concedes that it is targeting Intel 80286 machines and above but will not confirm the DOS Extender component.

DOS Extenders allow MS-DOS programs to take advantage of the protected mode of the 286 and 386, a feature that provides memory greater than 640K bytes. The software will also run under OS/2 and may be the first truly important OS/2 application.

Lotus began shipping to an initial group of 70 sites last week. That group will be expanded to include more than 5,000 users, according to Lotus officials.

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# Compaq drops Businessland

BY JULIE PITTA  
OF STAFF

HOUSTON — An ongoing debate over pricing discounts has resulted in Compaq Computer Corp. severing its ties with computer reseller Businessland, Inc., according to executives at both companies.

"Businessland has said they need to have preferential treatment compared with our other resellers," said Michael Swarley, Compaq sales and marketing vice-president. "Any kind of preferential treatment is against our policy and is non-negotiable."

Despite recent tensions between the companies, Businessland President, David Norman, expressed surprise at the Com-

paq decision. "We helped take Compaq into corporate America," Norman said. "We consider them a good long-term strategic partner." Sales of Compaq systems have consistently accounted for 15% of Businessland's revenue over the past 18 months, he noted. He said a decision has not been made to carry another personal computer vendor to make up for the loss of Compaq.

Sales to Businessland accounted for about 7% of Compaq's revenue last year, Swarley said. Computerland Corp., Compaq's largest customer, accounted for between 10% and 12% of its revenue in 1988, he noted.

Notwithstanding the volume of Compaq systems sold through the chain, Swarley said, "I don't believe that Businessland is pushing our product and hasn't for some time. I think they only sell our products when the customer asks specifically for Compaq and they can't sell them something else."

Norman said IBM and Apple Computer, Inc. extend better terms to Businessland than Compaq does. Both IBM and Apple offer a greater amount of expense statement funds to help the reseller offset training costs, the purchase of demonstration equipment and advertising, Norman said.



Compaq's Swarley

William Keiper, president of Microage Computer Stores, Inc., and the term he receives from Compaq are on par with other vendors.

"Compaq is a good gross-margin-producing product," Keiper said. "Our experience has been that Compaq has been very fair and evenhanded in its dealings with Microage."

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Bill Lempesis, PC industry analyst at San Jose, Calif.-based market research firm Dataquest, Inc., said IBM and Apple negotiate reseller terms on a dealer-by-dealer basis, while Compaq has always had a two-tier pricing structure that it applies to all resellers.

Last week's actions comes after several months of criticism leveled at Compaq by Businessland. Recently, Norman said his firm would do nothing to promote the Extended Industry Standard Architecture (EISA) being developed by Compaq and other PC clone makers in response to IBM's proprietary Micro Channel Architecture.

Swarley said Compaq's decision had little to do with Businessland's failure to publicly support EISA and that the decision was a result of a nearly three-year dispute between the two companies over specific terms.

Lempesis and Dataquest said the stand is to be the bigger loser. "If Compaq maintains its lead in the processor race, it means that Businessland won't have the hottest box," he said.

## Wyse eyes the prize

Wyse Technology stands to be the big winner in what is being called a no-win dispute between Compaq and computer reseller Businessland. It introduced an Intel Corp. 16-MHz 20286 PC last week priced at \$3,000 for an entry-level version and a 25-MHz 32386-based system priced at \$4,500 for a base configuration. Wyse is also discussing the possibility of a Micro Channel-compatible system that Businessland would sell under its brand name.

After what Compaq officials said was a three-year dispute over pricing discounts and other terms, Compaq dropped Businessland as a reseller last week. Compaq systems accounted for about 15% of Businessland's nearly \$150 million in revenue and was one of four PC lines that Businessland carries. Other vendors include IBM, Apple and Wyse.

"We want to become a larger part of their business," said Robert The, chairman and chief executive officer at Wyse. "This offers us a great opportunity to do that." The said Businessland is among Wyse's top three customers.

An increase in sales to Businessland could reenergize Wyse's flagging PC business. Last year, the company made a couple of strategic errors, raising system prices and failing to bring 32-bit-based systems to market in a timely fashion. As a result, Wyse has been left with a large inventory of 25-bit-based systems and is facing its first quarterly loss.

JULIE PITTA

## Bull retracts troubling maintenance policy

BY NELL MARGOLIS  
OF STAFF

Bull H. N. Information Systems, Inc. last week withdrew a controversial maintenance policy that had threatened to shut down the secondary market in large-scale Bull computers and damage the primary market as well.

Computer resellers and industry association leaders, all of whom have raised their voices against what one called Bull's "abusive C-12 policy amendment" since its adoption eight months ago, nevertheless agreed that, eventually, Massachusetts-based IDC Financial Services Corp. dealt the C-12 amendment its death blow.

In a letter dated Feb. 6, Charles Greco, the president of IDC Financial Services, which is an acknowledged leader in forecasting the residual value of computers, notified Bull of IDC's decision not to publish residual value projections for Bull's Honeywell 9000 series and to consider stalling all forecasts for Bull unless until the company clarifies

C-12. With its computers consigned to residual-value limbo, Bull would be effectively frozen out of the aftermarket along with everyone else.

In short, here is what C-12 does.

Last June, Bull (then Honeywell Bull, Inc.) altered its 12-year-old maintenance policy to stipulate that any large Bull machine off ordinary maintenance for more than 30 days or removed from its site for more than 10 days would have to be shipped — at the owner's expense — to the company's Phoenix-based plant for maintenance certification.

According to the policy, Bull could decide whether and to what extent a computer required refurbishing in order to be recertified. Bull would then do the refurbishing and bill the owner.

Apparently, no written guidelines were made available. Confusion and dismay spread as lessees — who depend on the prospect of aftermarket sales to make their leasing deals feasible — and resellers realized that potentially hefty and virtually incal-

culable costs were now going to come off the top of the resale value of any large-scale Bull. In a market in which IBM Credit Corp. has raised the competitive ante for lessors who primarily deal in IBM equipment, interest in dealing with other large companies — particularly Bull — has run high lately, said Kenneth Bousfield, president of the Computer Dealers and Lessors Association (CDLA).

Just as that interest mounted, however, "we find out that every machine that gets de-installed gets a trip to Phoenix and then gets robbed with a maul and a gun," Bousfield said. With the C-12 amendment, Bousfield said, Bull "was basically killing

its secondary market." Many lessors and dealers, he explained, said they believe that Bull intended to do just that and to hoard the rewards of the aftermarket for itself. If so, it may have outdone itself.

Bull, already under siege from CDLA, the Honeywell Large-Scale User Association and a few of individual companies that chose to negotiate over C-12, acted quickly in the wake of the devalued-value threat. Early last week, citing the privacy of customers, Bull's chief corporate vice-president, John Butler wrote to IDC Financial Services and announced that the C-12 amendment had been withdrawn.

## COMPUTERWORLD

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THE BOSTONIAN

# IBM shines up AS/400 family

BY ROSEMARY HAMILTON  
OF STAFF

IBM polished up its Application Systems/400 line with a host of options last week, including expanded low-end capabilities, steep price cuts on memory upgrades for higher end models and a high-end system.

But users and consultants contacted last week and the announcement of no ordinary introduction of the AS/400 instead, they claimed, it was IBM's response to reports of performance problems that are showing up on all models of the AS/400 when users run the systems with running more complex applications such as AS/400 Office.

The IBM spokesman said last year's reports of a low-end memory problem was a separate issue involving customers not running

in native mode. He added that there have been no reports of problems on higher end models.

"Nobody said they weren't getting expected performance on a B30 or above," he said.

"We're upgrading our memory now to get more efficiency out of Office," said Ron Capilla, MIS director at Kendall Co. in Boston, which is running an assortment of AS/400 models. "It was running poorly, but we hadn't originally configured our systems to include Office."

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## Branching out

IBM expanded AS/400 Model B20 increases user options for memory, storage and I/O cards

Model storage (in bytes)	432M to 2.6GM	4.8M to 2.6GM
Number of system I/O busses	1	3
Number of available card slots	4	9
DASD capacity (in bytes)	6.3GB to 94.8MB	63.0GB to 2.3GB
Typical number of users	8 to 20	13 to 30
Price	\$44,000	\$65,000
Includes operating system, disk and tape		
SOURCE: IBM		

## Reaching up

*When further options become available, the AS/400 Model 70 will offer more memory, more workstations attached and more communication lines than the Model 60*

	60	70
Relative performance <sup>1</sup>	5.5	7.3
Main storage (in bytes)	332M to 96GM	332M to 96GM
Maximum number of I/O card slots	71	71
Maximum DASD capacity (in bytes)		
with 9332 Model 600	27.3G	27.3G
with 9332 Model 600P	38.4G	38.4G
Maximum number of workstations/controllers	12	15 <sup>2</sup>
Minimum number of communication lines	32	48 <sup>3</sup>
Price (includes operating system)	\$324,500	\$379,000

<sup>1</sup> Model B10-2048 bytes user memory, 94320 bytes disk storage required; <sup>2</sup> Available Q4; <sup>3</sup> Available Q4; currently 32

SOURCE: IBM  
COURTESY: FRANCIS CYCLES/IBM

## PC Systems pulls out of Leading Edge deal

BY ALAN J. RYAN  
OF STAFF

**RIVIERA BEACH, Fla.** — Stewart Faxon, owner of PC Systems, Inc., last week withdrew his offer to purchase the Leading Edge name and logo from financially troubled personal computer closer Leading Edge Products, Inc. in Canton, Mass.

Faxon had originally agreed to pay \$921,000 for the Leading Edge name and logo, which was approximately the amount Leading Edge owed him when it stopped shipping computers to dealers who had pre-paid for them earlier this year.

Faxon and the deal collapsed when Steven Gray, managing director of a Boston-based financial consulting firm and the co-appointed Chapter 11 trustee for Leading Edge, did not agree to the terms Faxon had proposed, which included allowing him to ship to dealers some

\$10 million worth of Leading Edge computers that are currently warehoused in Los Angeles.

According to Faxon, Gray told him he should spend \$5 million to \$10 million to Leading Edge to secure the release of those machines and that Leading Edge's licensees would handle the distribution.

Faxon said he refused to accept Gray's terms. "It is very peculiar that you throw a life raft to a drowning man and the drowning man says it isn't a good enough life raft," Faxon said.

In a prepared statement, Gray said his immediate objective is to engage a managing agent to work on his behalf to fund and operate the firm until a reorganization plan is confirmed by the U.S. bankruptcy court.

"This approach could result in the court's eventual ownership of Leading Edge Products," Gray said.

## Exec says SAA office tools imminent

BY STANLEY GIBSON  
OF STAFF

**ATLANTA** — IBM is set to announce an integrated office software package soon that is compatible with its Systems Application Architecture, according to IBM Vice-President Earl Wheeler, who has primary responsibility for SAA.

Although the widely anticipated software is often referred to as SAA Office, Wheeler did not use that name, nor did he elaborate on what he meant by "soon." An IBM spokesman declined to comment on Wheeler's remarks but did say that no such announcement is planned for the week.

Wheeler described the integrated software as the "first integrated SAA product" while

speaking at the general session of the Knowledgeware, Inc. User Conference here last week.

The executive told some 800 attendees that the software will offer document preparation, electronic mail, document management and an iconic interface. In addition, it reportedly will have document interfaces and will contain "the next level" of Common User Access, a graphical user interface.

Independent software vendors will have many applications ready the day the office software is announced, Wheeler said. Peter Morgan, vice-president of marketing at Software 2000, a Hyannis, Mass.-based vendor of financial and human services software for the AS/400, said his firm will attend the announcement, although he could not specify the date. Software 2000

is a member of the IBM Business Partner program.

Morgan said he attended a briefing given over IBM's field network technology for IBM personal and business partners last week. During the broadcast, IBM sales representatives were advised they could begin selling the office software to customers.

Morgan said the broadcast also discussed AS/400 Debit/Credit benchmark results that IBM has in hand. Although an IBM spokesman denied that the company had conducted Debit/Credit benchmark tests on the AS/400, one analyst said IBM admitted to him that the results exist. "IBM says they have them but won't release them," said John Logue, executive vice-president at Aberdeen Group in Boston.

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# OS/2 for 386 will not be out this year

BY PATRICK WAURZYNIAK  
OF CSWORLD

REEDMONT, Wash. — An upgrade of OS/2 with Presentation Manager specifically designed for the Intel Corp. 80386 microprocessor will not ship to end users until sometime in 1990, Microsoft Corp. confirmed yesterday.

At the company's third annual systems software forum, Microsoft said it plans to ship 386 OS/2 tool kits to its developers later this year, with delivery of an end-user, 386-specific OS/2 version scheduled for an undetermined date next year.

In the meantime, Microsoft demonstrated an early version of its Windows 3.0 operating environment, currently being developed by the personal computer software market leader.

## Over the barrier

The demonstration, which was called Windows Version 3.0 Debug Release 1.1.4, showed the program's ability to load several applications into memory above the 640K-byte DOS memory limit.

The company loaded a large Microsoft Excel spreadsheet, Microsoft Write, Aldus Corp. Pagemaker and a Pagemaker

application and still had 836K bytes of memory free under the new Windows version.

While Windows 3.0 appeared to operate in protected mode, which allows up to 16M bytes of addressable memory, Microsoft Vice-President of Systems Software Steve Ballmer dismissed any potential adverse impact that such a Windows release could have on the firm's OS/2 Presentation Manager version, which can also run applications above the 640K-byte barrier.

Thomas Galvin, an analyst at Smith Barney, Harris Upham & Co. in New

York, said that Windows 3.0 should have little tangible effect on OS/2's ramp-up. He noted that Windows 3.0 still lacks the multitasking and interactive communications capabilities of OS/2.

"I view it more as a way to show users what they could do with the 386," Galvin said. Windows 3.0, he added, "gives them some momentum to their whole push for Presentation Manager and for their technology."

Although Ballmer would not be more specific on the company's timetable for delivery of the 386 OS/2 Presentation Manager tool kits and end-user 386 OS/2 products, he and other Microsoft executives nevertheless remained upbeat about the outlook for OS/2 Presentation Manager applications development.

## FTS-2000

CONTINUED FROM PAGE 1

being awarded, according to James F. Kerrigan, a federal market analyst at Input, Inc., in Vienna, Va., and other sources.

GSA officials said the action is necessary because of legislation enacted last year by the U.S. Congress, which sought to curb defections from FTS-2000 by making it mandatory for federal agencies to use the new intercity network.

"They're just implementing the wishes of Congress . . . but it's a very aggressive implementation," said Eben G. Townes, a procurement analyst at the market research firm IDC Washington, Inc., in Vienna, Va. For example, the GSA turned down five of six network procurements planned by the U.S. Department of Commerce. Reed Phillips, director of information resources management, and that only a network for the 1990 census was given as exception.

Some federal managers such as Phillips and Martin Wagner, director of telecommunications management at the Department of the Treasury, support the GSA action as a logical implementation of the law, but others oppose it. One network manager, who requested anonymity, said he was worried that FTS-2000 data services may not be available soon enough to meet user requirements at his agency.

Specifically, GSA's new policy includes the following order:

- Agencies are required to use FTS-2000 for all voice, data and video services that the FTS-2000 contractors provide, unless the GSA grants an exemption.

- Agency networks must incorporate FTS-2000 services as they become available.

- When existing contracts expire, agencies must convert to FTS-2000 and must not exercise renewal or extension options. Also, exemptions previously approved for the Department of Defense are withdrawn and will be reviewed.

- The GSA will help agencies develop plans for switching to FTS-2000.

The GSA also signed an aggressive agreement with the telecommunications industry to 100 agency computer procurements to help stem them away from bid protests that plague many procurements.

Numerous procurement scandals and pressure from Congress are driving the GSA toward a stronger oversight role, analysts and federal managers observed.

"GSA is being perceived as too easy now, so they're going to toughen up a little bit," Kerrigan said.



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PC and MS

## Anatomy of a strategic alliance

Hewlett-Packard and 3Com said the first wave of products from their strategic alliance will be delivered in the second quarter and sold by both companies. The two outlined the following areas of joint product development, cooperation and marketing:

- Forming the basis of HP 3+Open LAN Manager with 3Com's 3+Open network software, which is based on Microsoft's OS/2 LAN Manager.
- Eventually linking HP's OS/2 offering to its 3000 and 9000 minicomputers.
- Ensuring 3+Open will work with LAN Manager/LX, a Unix port of LAN Manager co-developed by Microsoft and HP.
- Co-development of a common TCP/IP for their LAN Manager-based products and a variety of network services and

- multi-vendor connectivity products.
- Network management products operating under HP's OpenView architecture.
- CCITT X.400-based electronic mail to enable HP and 3Com E-mail users to exchange messages with each other and other E-mail systems that support X.400.
- Incorporation of features from HP's New Wave user interface into future releases of 3Com products.

Currently, 3+Open supports MS-DOS, OS/2 and Apple Computer, Inc. systems. HP supports Unix as well as its MPE/iX proprietary system. The idea is to give users in both environments access to applications and systems running under all of these environments.

PATRICIA KEEFE

## HP buys

CONTINUED FROM PAGE 1

next two to three quarters," said Frank Dunbeck, a network consultant and president of Network Communications Architects.

In addition to the service, a 3Com spokeswoman said that the vendors' top priority was porting 3Com's 3+Open network software, which is based on Microsoft Corp.'s OS/2 LAN Manager, to Unix. This would enable 3+Open, which will be resold by HP, to talk to HP's Unix port of LAN Manager, LAN Manager/X (LM/X). LM/X will reportedly ship in the fourth quarter.

Under a nonexclusive agreement, HP said it will provide worldwide support for 3Com systems, including its Bridge Communications, Inc.-based products. Customers of both vendors can now purchase support services for HP and 3Com equipment under one contract.

"It has given us more confidence in HP support," said an HP and 3Com user at a large paper products company in the Northwest who currently has his 3Com networks serviced through an agreement with an independent contractor. He said he is inclined to hand over all his 3Com service needs to HP, praising the ability to maintain one service contract as a positive move.

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**SOFTWARE  
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With more MIS directors taking charge of local-area network purchasing (CW, Feb. 20), LAN vendors are moving quickly to rid themselves of a reliance on reseller-provided services. 3Com rival Novell, Inc. also unwrapped arrangements last week with four service providers, including HP.

"Service and support will more and more become the differentiating factor. For 3Com to develop the support infrastructure it needs to compete with DEC and IBM in corporate accounts is an awesome task," said Steven Spanier, an analyst at Infonetics, Inc., a market research firm in Santa Clara, Calif. On the other hand, HP's service is rated very highly in the kinds of arrangements that 3Com wants to create with service providers.

The scalable server concept ties in well with the desire of minicomputer vendors to both feed off the encroachment of high-end workstations and tie their Unix systems into MS-DOS-based LANs.

"I'd really like to see HP mimic as servers," said David Mathews, manager of the computer center at the Business School of the University of Southern California at Los Angeles.

3Com Chairman William Krause said the partnership will also result in a broad range of distributed computing products based on industry standards, with a clear emphasis on Transmission Control Protocol/Internet Protocol and CCITT X.400.

# ORACLE FINANCIALS

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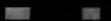
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## ISDN-hungry

CONTINUED FROM PAGE 1

One such user is Tennessee Bell, Inc., which cut over to Southwestern Bell's ISDN Centrex service last summer. The Houston-based holding company's telecommunications department found that virtually all of the RS-232-based communications packages it tested ran unmodified over its ISDN links, according to Thomas Simmons, manager of worldwide telecommunications at one Tennessee division.

For example, Tennessee now uses Netline, Inc.'s Manylink as a window-driven, menu-based front end that makes it easier for nontechnical PC users to access IBM's Professional Office System. But Manylink

supports only 19.2 kbit/sec. — 30% of a 64 kbit/sec. ISDN B channel. While Tennessee is along OK with that speed right now, Simmons says his company will definitely want 64-kbit speeds for more advanced applications that are now being considered such as local-area network bridges and image transmission.

### Individual interfaces

Netline is one of several software vendors working on 64 kbit/sec. versions of their packages. Unfortunately, the lack of a software interface standard requires supplying the package with a different interface for each vendor's ISDN board or phone set, and Netline Executive Vice President Byron Smith.

The same problem applies to a slowly

emerging breed of software packages designed specifically to take advantage of ISDN's voice/data integration.

Hypersys, Inc.'s Hypersys, for example, has an entire capability that allows users at the University of West Virginia to dial up their PCs and transfer files from home, according to Jeffrey Fritz, a data communications analyst at the university.

Hypersys supports speeds of up to 38.4 kbit/sec. over the B channel, "which is important for multitasking applications on OS/2 or Apple's MultiFinder," Fritz said. The software supports both Telrad Telecommunications, Inc.'s and AT&T's ISDN telephone sets.

However, users with one type of set cannot talk to users of the other because

vendors use different rate-adaption schemes, Fritz said.

ISDN workstations are another area to feel the standards blight. The majority of communications software companies currently support IBM Personal Computers, but powerful multitasking systems such as OS/2 workstations or the Apple Computer, Inc. Macintosh are "absolutely required to do the sophisticated stuff like screen sharing, keyboard control over an ISDN line and doing transmissions and spreadsheets simultaneously," said Joe Saccette, formerly Tennessee's director of telecommunications.

### Specific boards needed

Although workstations can hook up to an ISDN phone set via their RS-232 ports, they need ISDN boards designed specifically for their operating systems to really take advantage of the technology, vendor sources said. Right now, most available boards support IBM PCs. Telcos Communications, Inc. is working on an ISDN board for Unix. Northern Telecom, Inc. recently has demonstrated a Macintosh board and Apple itself recently hired an ISDN product manager, so the situation is bound to change for the better.

A related problem is that private branch exchange (PBX) vendors have yet to support ISDN's Basic Rate Interface, which would provide third parties with access to their switches' functions via ISDN. While AT&T has officially announced Basic Rate Interface support, it is still pushing its proprietary "ISDN-like" Digital Communications Protocol (DCP), according to one third-party vendor.

AT&T subsidiary American Transtech has found DCP quite adequate for linking user workstations to AT&T's ISDN Primary Rate Interface service, according to Transtech telecommunications manager Todd Stevenson. However, that is because the Jacksonville, Fla.-based financial computer service has stock with all AT&T terminals, he added.

More bothersome to Transtech is the current lack of ISDN standards for linking host software to PBXs. AT&T has already provided Transtech with the software to link its 3B computers and System 85 PBXs so that telemarketing agents automatically get a customer's profile on their screens when the customer calls. But Transtech programmers would have to write their own interfaces to provide the same application on the company's other computers, Stevenson said.

AT&T has promised Transtech that it will soon deliver a standardized link between its PBXs and a variety of computers, Stevenson said. Still in question, however, is whether other PBX vendors will support the standard.

Northern Telecom, Inc. has also promised an ISDN-based interface between its PBXs and a variety of hosts, according to Richard Clements, telecommunications manager at Nice Corp. in Folsom, Utah.

Nice, like Transtech, has avoided certain incompatibility problems by sticking with one vendor — in this case, Northern Telecom, Clements said.

"But at conferences, a lot of users are saying standards bodies are too slow, and vendors are meanwhile doing their own thing," he added. In particular, the lack of standard messaging formats means that different vendors' PBXs cannot exchange information, even though both are technically ISDN-compatible, Clements said.

# Who's getting into your VTAM Network tonight?



Let your security package (ACF2, RACF, TopSecret, VMSECURE, etc.) check on who can get into your VTAM Network before they try to access an application.

Available for MVS, VM/GCS, and VSE, THE NETWORK DIRECTOR can require a User ID and Password before allowing the terminal user to attempt to connect to VTAM applications like CICS, TSO, CMS, etc.

Once the user has entered a User ID and Password, THE NETWORK DIRECTOR can validate this information against the security package through standard interfaces (not exits). Once validated, THE NETWORK DIRECTOR can present the user a dynamic menu of only those VTAM applications that the user is allowed to access.

When the user selects an application from the menu, THE NETWORK DIRECTOR can automate the signon to the application (see list of applications below) so that the user need not repetitively identify himself when switching between applications.

With THE NETWORK DIRECTOR, it is easy to create a "single-point logon" and a "single system image" concept for your VTAM Network and yet also enhance the security of your network.

And THE NETWORK DIRECTOR provides this

concept without the inherent overhead of multiple concurrent session software in the host or session establishment dialog.

- Of course, there's a lot more too:
- Accounting and auditing of network activity,
- Bulletin board and help panels,
- Dynamic application status display,
- Automated signon interfaces to CICS, IMS/DC, IDMS/DC, TSO, CMS, ROSCOE, Model 204, CompuNet, NCFCE, & NetView,
- User validation interfaces to: ACF2 (MVS & VM), RACF (MVS & VM), TopSecret (MVS), VMSECURE (VM), the VM Directory (VM), & THE NETWORK DIRECTOR definitions (MVS, VM, VSE),
- Dynamic online maintenance,
- Broadcast and message facility,
- Intelligent card smart card identification support.

For more information, or a free trial of THE NETWORK DIRECTOR, please contact North Ridge Software by phone (206) 882-2660 or by FAX (206) 881-6904. Or mail the coupon below.

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# Vying for attention on the plant floor

## IBM WATCH

TONY FRISCA

**Although IBM is No. 1 in providing key manufacturing technologies such as production control and computer-aided design and manufacturing (CAD/CAM), it lags behind competitors DEC and Hewlett-Packard as the vendor of choice for the primary plant-floor platform.**

Unaccustomed to finding itself in the runner-up position, IBM is using its full resources to capture users' attention on the plant floor. The firm recently introduced the plant-floor series Distributed Automation Edition (DAE), which offers a scalable product line that allows users to run tasks cooperatively on a number of different nodes. Within this framework, IBM is positioning the 9370 as a small plant host or area computer. Support for cells and plant devices is through the personal computer family — the core of the IBM plant-floor strategy.

Along with the introduction of DAE, IBM is making a number of moves to intensify its push to improve its market standing. Two themes are emerging from this thrust: IBM is leveraging its own investment in factory automation to yield internal and external product-development benefits, and the company is putting the message out about the payoffs of computer-integrated manufacturing (CIM) through marketing programs and downgrading requirements to universities.

These activities contribute significantly to the development and acceptance of DAE. The DAE strategy stems from IBM's internal investment in manufacturing automation. Unlike most manufacturers, IBM can devote extensive resources to turning internally developed manufacturing technology into a commercial business. To support this opportunity, however, the company needs to establish credibility as a plant-floor vendor. The university program and customer education programs are longer-term strategies to seek market acceptance.

### Learning CIM lessons

Without the experience of automating itself, IBM could not have realized the features that a CIM platform requires. In the past few years, much has been written about the technical problems of CIM. Studies show that the problem with making an investment in factory automation is that each plant or process is unique and therefore requires a custom solution.

Until recently, vendors have not offered users the tools to minimize the custom content of major CIM projects. This problem limits the prospects for rapid CIM market development. A user who wants to fully automate is forced to either go into the computer business or to take on the massive job of building piece-meal solutions on multiple platforms. Neither alternative is acceptable.

IBM is well placed to take on the expense of building such platforms because the costs of developing these tools for in-

ternal use can be offset by "productizing" for users. In addition, such facilities are usually turned into marketing showcases.

A question still arises: IBM has little traditional standing on the plant floor — in fact, it is negatively regarded by the plant-floor user culture, which is more accustomed to other vendors and noncomputer control. How does it overcome this?

### Proactive approach

Answering the challenge, IBM quickly rolled out CIM and plant-floor products to its direct sales force, users and third-par-

ty distributors. The company set up a CIM National Support Center in Boca Raton, Fla., for training and support. It installed 14 regional hands-on demonstration centers and 44 minibranding centers. IBM provided an extensive road show that attracted more than 1,700 users and sales representatives in 17 cities.

This marketing effort included a special "CIM in Universities" campaign. To date, IBM is working with almost 50 colleges and high schools as part of its Academic Computing Information Systems (ACIS) program. This CIM program will cost IBM approximately \$25 million,

not including promised technical and consulting expenses.

This ACIS program is especially important in seeding IBM's focus in the plant-floor market. IBM established a similar program in the engineering market several years ago at the height of its aggressive move into CAD/CAM, and IBM has since firmly its position as the market leader in that field.

This university program is strategically linked to IBM's future growth in the factory. It is also a confirmation that IBM's commitment to this business is long term, since the investment will take several years to pay off. If the program works, however, the company could go from parish to preferred vendor in the plant-floor computing market.

## "Computerworld Response Card Decks really opened doors to the 'heavy-hitter' accounts..."

**Spectrum Concepts, Inc. is a 10-year-old software developer based in New York City. The company, which provides software and services to large corporations and financial institutions, recently developed XCOM 6.2, an LU6.2-based software product that dramatically improves file transfer between different computing environments.**

XCOM 6.2 eliminates the need for extensive custom programming when transferring data from one computer to another, including PCs, mainframes and minis. And it significantly lessens the amount of time necessary to complete connectivity projects.

Company president Alec Gindis was impressed with the response after a news story announcing XCOM 6.2 appeared in Computerworld. So when Spectrum began implementing its marketing strategy for the new product, he considered Computerworld a key resource.

"Our goal was to generate sales leads from major organizations — Fortune 500 and Fortune 1000-type companies — that need to transfer files. We decided to use response card decks, and, based on the response we received from Computerworld, Computerworld's was the card deck we thought of first.

"And it's paid off; the results have been terrific. We've received hundreds of high-quality leads so far, and they're still coming in. In fact, Computerworld Response Card Decks really opened doors to the 'heavy-hitter' accounts — major organizations that learned about us through the card decks.

"Now we've gotten to where we are recruiting additional account executives to follow up on the volume of these leads. Computerworld Response Card Decks give us the best cost per lead of any medium. They also let us refine our market by segmenting through scientific 'split testing' — something other card decks don't always offer. We consider that a valuable bonus."

Computerworld Response Card Decks give you a cost-effective way to reach a powerful buying audience of over 127,000 computer professionals. They're working for Spectrum. Call 212-512-1500 and we can work for you. Call 212-512-1500, Account Manager, Computerworld Key to Card Decks, or (201) 967-1550 to reserve your spot today.

## COMPUTERWORLD RESPONSE CARD DECKS

Computerworld is an IDG Communications Newspaper

Frisca is president of Advanced Manufacturing Research, Inc., a Boston, Mass.-based research and consulting firm.



— Alec Gindis  
President  
Spectrum Concepts, Inc.

# U.S. Companies Involved In ISDN Trials And Service Rollouts

Company	Switch	Access	Carrier	Status	Note
At&T, Hartford, Conn.	AT&T 8500	Basic	Southern New England Telephone	Installation underway	
Avantel Systems, Phoenix, Ariz.	AT&T System 85/PRIVACY	Primary	AT&T	Started July 1989	First customer of AT&T's Primary Plus.
Avantel, Indianapolis, Indiana, Ind.	AT&T System 85/PRIVACY	Primary	AT&T	Started Dec. 1987	Same test site for AT&T's Primary Plus.
Avantel, State of, Phoenix	Western Telephone 2545-100	Basic	US West Communications	Started Nov. 1989, officially ended	
BellSouth Co., South	AT&T 8500	Basic	US West Communications	Scheduled start Nov. 1990	
Connex, Atlanta University, Pittsburgh	AT&T 8500	Basic		Contact pending	
<hr/>					
Central Corp., Atlanta	AT&T 8500	Basic	Southern Bell	Started April 1989	Paying customer.
Central City Corp., Minneapolis	NEC 3000/4000	Basic	US West Communications	Started Nov. 1987, ends Mar. 1989	Test.
Charter Telephone, Atlanta, Ga.	AT&T 8500	Basic	Southern Bell		
Connex, South Co., Rochester, N.Y.	Western Telephone 25-100 PBXs	Primary		Started Aug. 1989	First Primary Plus using line 25-100s.
FirstNet National Telephone Access, Washington	AT&T 8500	Basic	CSP Telephone	Started June 1989	
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Globe Inc., Research Triangle Park, N.C.	AT&T 8500 and 2545-100	Primary/plus	AT&T, Basic	Started June 1989	First Primary Plus/plus line in one test.
Horizon, Rocky Mount, N.C.	Western Telephone 2545-100	Basic	Connex Telephone	Scheduled start Jan. 1990	
Hyper Microprocessor Products Inc., Houston, Tex.	AT&T 8500	Basic	Southern Bell	Started April 1989	Using RDX to develop ISDN products.
Interlink Peabody Corp., Houston, Tex.	AT&T 8500	Basic	Pacific Bell	Sept. 1987 to Sept. 1989	
Interlink Information Systems (Interlink and BellSouth)	Western Telephone 2545-100	Basic	Connex of Pennsylvania	Scheduled start Oct. 1989	Will include ISDN satellite transmission.
Interlink Information Systems (Interlink and BellSouth)	Western Telephone 2545-100	Basic	US West Communications	Started Jan. 1979, officially ended	Applications included distance measurement between offices and monitoring of lines.
<hr/>					
Interlink Hopkins Medical Center, Baltimore	AT&T 8500	Basic	CSP of Maryland	Contact pending	
Lawrence Livermore Laboratory (University of California), Livermore, Calif.	AT&T 8500	Basic	AT&T Federal Systems		
Long Island Utilities and Gas Co. Inc., Long Island, N.Y.	AT&T 8500	Basic	Pacific Bell	Started Sept. 1987, ended Sept. 1989	Test.
Mass. Institute of Tech., Cambridge	AT&T 8500	Basic		Scheduled October Oct. 1989	Using AT&T 8500 as PBX for ISDN research.
Miller/McPhee Corp., Somersworth, N.H.	AT&T 8500	Basic	AT&T Federal Systems	Started Aug. 1989	Access for ISDN development 0.25 cents.
<hr/>					
Northwest Bell Telephone, St. Louis	Primary	AT&T	Unannounced		
Northwest Bell, Everett, Wash.	Basic	West Oregon Telephone	Installation underway		Part of service control.
Networks Inc., Schenectady, N.Y.	Western Telephone 2545-100	Basic	Southern Bell	Planning stage	
NASA, Washington	AT&T 8500	Basic	AT&T Federal Systems		
Netcom Corp., Cypress, Calif.	Western Telephone 25-100	Primary			Telecommunications company using private ISDN.
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Northwest Bell, Houston, Tex.	Western Telephone 25-100	Primary			Planning in Dallas, N.D. and Monroe, La.
Peripherals, St. Paul, Minnesota	Western Telephone 2545-100	Basic	Bell of Minnesota	Contact pending	Partnership network with ISDN in Minnesota.
Post&Tel Whiting, East Whiting, Conn.	AT&T 8500	Basic	SNET		
Pilot Computer Inc., Herndon, Va.	AT&T 8500	Basic	Southern Bell	Started April 1989	Paying customer.
Rockwell Communications Systems, Dallas/Ft. Worth, Texas	AT&T 8500 with line numbers	Basic	Southern Bell	Scheduled start Dec. 1989	40 buildings in a campus environment will be tested on ISDN.
<hr/>					
Rock Bell Co., Houston	AT&T 8500	Basic	Southern Bell	Start Sept. 1989	Plan to use 1,000 ISDN lines.
Southern Methodist University, Dallas	Western 8500	Basic	Southern Bell	Started Feb. 1990	
Southern States Corp., Atlanta	AT&T 8500	Basic	Southern Bell	Started April 1989	Paying customer.
SII Corp., St. Paul, Minn.	AT&T 8500	Basic	Southern Bell	Started Aug. 1989	Plan to use 2,400 ISDN lines.
Titancom Inc., Houston	AT&T 8500	Basic	Southern Bell	Started June 1989	Plan to use 2,000 ISDN lines.
<hr/>					
University of Arizona, Tucson	AT&T 8500	Basic	US West Microelectronics Inc.	Planning stage	Using AT&T 8500 as PBX in research center.
University of Connecticut, Storrs	AT&T 8500	Basic	SNET		
University of Indiana, Bloomington	Western Telephone 2545-100	Basic	Indiana Bell		
University of Maryland, College Park				Unannounced	
University of South Florida, Tampa	AT&T 8500	Basic	OTC South	Started Oct. 1989	
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U.S. State of Oregon, Portland	Western Telephone 2545-100	Basic	US West Communications	Started March 1989	Test.
Westel, State of, Newark	AT&T 8500	Basic	CSP of Virginia	Started April 1989	
West Virginia Telephone, Morgantown	AT&T 8500	Basic	CSP of West Virginia	Scheduled start Dec. 1990	Plan to use 600 ISDN lines.

Note: This chart was compiled by CommunicationsWeek with information provided by various Communications Inc. Subsidiaries, as well as from news releases and published reports. Contacts with manufacturers and their affiliated subsidiaries are not listed.

AT&T 8500 2545-100 25-100

# The ISDN Scorecard.

As the demand for ISDN grows, so does the number of ISDN suppliers eager to take credit.

But, as you can see by this CommunicationsWeek chart, there is one clear-cut ISDN leader—the company that helped build the standards for ISDN. That company is AT&T.

**95% of ISDN lines are on an AT&T 5ESS® switch.**

AT&T Network Systems has helped more local telephone companies install more ISDN lines than any other telecommunications supplier—95% of non-trial ISDN lines. What's more, we've already shipped over 200,000 ISDN lines for future use. Today, 99 central offices can offer operational ISDN services over the AT&T 5ESS switch, with a total of 415 upgraded with ISDN software.

So, while other suppliers are still in product development trials, AT&T Network Systems is helping phone companies across the nation offer ISDN services right now on today's network. Services such as simultaneous voice and data transmission, high-speed facsimile and electronic mail all over a single phone line.

**ISDN is just the beginning.**

We believe that ISDN is the beginning of a bigger future. A future we call Universal Information Services. A future where networks can carry voice, data and image into anyone's office or home at any time in any combination, with maximum convenience and economy.

At AT&T Network Systems, this belief is already driving our technology, our product development and our commitment to you.



**The right choice.**

## EDITORIAL

## The real target

**T**HE NEWS THAT an 18-year-old Chicago hacker will spend nine months in prison without the possibility of parole [CW, Feb. 23] is encouraging to those who advocate a hard line against computer crime. But the conviction and sentencing of Herbert Zinn Jr. under the Computer Fraud and Abuse Act of 1986 also raises a disturbing set of questions about who will be prosecuted under that and other statutes.

On the one hand, it appears that Zinn got what he deserved for purloining more than \$1 million worth of software, destroying files and publishing information on how to crack AT&T's computer security system. His sentence should put a damper on the type of computer bulletin-board chatter that advocates this kind of flagrant disregard for property and privacy. It also sends a message to would-be hackers that breaking into corporate computers is as bad as breaking into corporate offices — and will be dealt with just as sternly.

But the conviction of the "Shadow Hawk" raises new questions about whom the hacker laws protect and whom they convict. Hackers like Zinn are a relatively easy target. They are usually kids operating out of their homes who have little understanding of the organizations they are penetrating. They prowl around until they hit on something juicy, then alter a file or leave a message. Their agenda is to hack for the sake of hacking; any havoc they wreak along the way is incidental.

The more devious and far more dangerous computer criminal is the corporate insider. This hacker usually knows just what he wants to do and how to do it. He works quietly and quickly, deleting or altering batches of files and covering his tracks as he retreats. He is devastating and elusive.

Corporations have an annoyingly schizophrenic attitude toward these two breeds of intruders. They willingly make an example of the amateur hacker but cover up the damage wrought by the pro. Fearful of negative publicity, embarrassed by their own vulnerability, they fire the guilty employee and swallow losses that may run into the millions rather than expose their weaknesses in court.

This brings up an interesting question. Who will be the target of new antihacker legislation? Using it to prosecute loners like Zinn or alleged Internet hacker Robert Morris Jr. may scare off the small-time crooks, but the big offenders will still get away with a kick out the door. This situation will continue until a major bank or insurance company is ready to step out of the shadows, lay bare its mistakes and throw the book at one of its own.

We have long supported legislation to treat computer crime the same as any other crime against property or privacy. Federal and state authorities and the courts are now showing a willingness to do their part to prosecute and sentence violators. We hope the victims won't remain silent.



## LETTERS TO THE EDITOR

## Clear as Bell

Regarding the article on Bell Atlantic's Lasserver Plus local-area network server [CW, Nov. 7], David Terrie, president of Newark Consulting, appears to misunderstand our product.

Lasserver Plus software integrates Bell Atlantic's Langate central office-based LANs with higher speed, premises-based Ethernet LANs and, early next year, with Token-Ring LANs.

Also, Bell Atlantic provides customers with a full range of services, including financing, leasing, installation, maintenance and custom-solution design.

Terrie's comments regarding PC servers and software fail to recognize that we are targeted at very different markets than the Bell Atlantic product. Our product was designed especially for Langate networks, connecting users who may be miles apart; Novell, Inc.'s Netware and 3Com Corp.'s product can not run on Langate.

Finally, Lasserver Plus supports for Token-Ring LANs will not be available until Release 2, which will integrate the preexisting Langate and Lasserver Plus network management features.

W. Davis Douglas III  
Assistant Vice-President  
Product Line Management  
Business Services  
Bell Atlantic  
Arlington, Va.

## Too big fermi

While Charles Lecht's article [CW, Jan. 16] is in part out of this world, he should spend more time reviewing earthly dimensions: His definition of a fermi is

1,000 times too big. It is actually one quadrillionth of a centimeter.

Anthony Whitman  
Chief Engineer  
System Development Corp.  
of Japan  
Tokyo

forces to contend with.

With inventory levels for computer hardware at an all-time high, vendors are basically selling equipment that was manufactured when dynamic random-access memory (DRAM) prices were at their highest.

Also, it takes 30 to 45 days to assemble components, manufacture a product and then package it. So, even in a best-case scenario, it might take a vendor about two months to bring a project to market that reflects the lower priced DRAMs.

Nonetheless, if you really want to strike a blow at greed, why not blow the whistle on the DRAM vendors? Both American and Japanese firms played a key role in bringing about a poorly conceived trade agreement that did not fully take into account the dynamics of the marketplace.

Indeed, the trade agreement let DRAM vendors take advantage of market conditions to raise prices and resorb exorbitant profits at the expense of consumers and systems integrators.

As a board and subsystem manufacturer whose lifeline is very much dependent upon the availability and pricing of DRAMs, I urge the Bush administration to overhaul the trade agreement so that, in the spirit of competition, consumers get a fair shake.

Cliff Wildes  
President  
Microtek International  
Brentwood, Conn.

## This week in history

Feb. 26, 1979

Two employees of Electronic Data Systems Corp. (EDS) held hostage by the Iranian government are freed in a commando-style raid organized and financed by EDS Chairman H. Ross Perot and U.S. Army Green Beret Col. Arthur (Bull) Simons. Iran had seized the EDS employees to force the firm to return to the Middle East.

Feb. 27, 1984

IBM replaces its 3080 series of mainframes with the 3083, 3085 and 3084 "models," whose design and circuit packaging changes reportedly boost internal performance 5% to 14% over current models. Current 3080 series users cannot field-upgrade to the new machines, however.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Lehris, Editor, Computerworld, P.O. Box 9171, 375 Cochrane Road, Framingham, Mass. 01701.

# Why not make it right the first time around?

EFREM G. MALLACH

Funny how people get more credit for fixing a problem than for avoiding it in the first place. Any fool can drive a car to miss a telephone pole. Making a car drivable again after it hits that pole at 40 miles per hour takes talent.

We react the same way in the computer business, and vendors know this. It is amazing how often they create a problem and then fix it with fiascio rather than avoiding it in the first place. It is time to remind now we thank them for their service rather than asking why. Don't wait in the first place.

Here are a few examples of vendors featuring the fix:

**Datapoint.** Many years ago, this company offered only small, slow, eight-bit processors. All of its competitors had bigger and faster 16-bit ones.

Datapoint's engineers apparently were not very good at designing fast CPUs. So they put several small systems on a wire and invented Arnet, the world's first local-area network.

The marketing folks pushed modular expansion, file servers and other 1989 hot products — back in the mid-70s. They did next to nothing with the concept for a while. Then, why Datapoint chose this approach. And customers never questioned it.

**DEC.** Every article on artificial intelligence mentions Xcon, one of the first successful industrial systems. In the days of the VAX 11/780, there were reportedly only five or six engineers within DEC who could consistently get VAX configurations right. So Xcon was developed to check VAX configurations for validity.

The question nobody asked was, why could every other mini-computer vendor design systems of the same performance level and configuration flexibility in such a way that the ordinary mortals on their staffs could figure them?

**IBM.** Systems Application Architecture (SAA) is intended to provide common interfaces to several inherently incompatible systems. IBM is fixing a problem and should get credit for doing so.

But let us not forget that the problem is one of IBM's own making. It resulted from IBM management's never having

forced products of different families to work alike. While SAA's benefits — should they survive — will improve the existing state of affairs, it would have been better for users if IBM had managed its product lines to provide user-level compatibility among disparate architectures earlier, and with no noise.

The word "architecture," by the way, should be a red flag. Hearing it usually means that one is about to endure a massive dose of "If you can't fix it, feature it." Lengthy presentations of grandiose architectural schemes are a standard cover-up for lack of results.

IBM. (It is) enough to get two more (IBM) Systems 36 users who upgraded to the B10 or B20 models of the Application Systems 400 with the minuscule 4M bytes of memory found themselves with far less performance than they had before. IBM did the right thing; it offered these users another 4M bytes free for a year and set up support mechanisms to speed their conversion to the lower overhead native AS/400 mode.

Yet amid the praise being heaped on IBM for taking these steps, we tend to forget one thing. The praise is for dealing with a situation that proper testing would have caught and that IBM never should have permitted in the first place.

Problems are not going to go away. Computer systems and their applications grow more complex daily. Perfection, as an admirable goal, is not always attainable. The way in which a firm rises to the challenge of dealing with its self-inflicted wounds is a good test of that firm's character.

However, when a vendor puts a problem-solving product or service as a tool to its customers, those users owe it to their management and stockholders to ask the following hard questions:

- Precisely what, dear vendor, is the problem you are solving?
- Was this problem of my doing — or one that you created yourself?

- Should this problem exist in the first place? Do your competitors have it? If not, why not?
- Why couldn't you avoid the problem? What steps have you taken to keep the same thing from happening again?

- If it does happen again, how do I know you'll be just as eager to fix it next time? And will you put that in writing?

It is up to users to keep vendors on their toes. To do this job properly, users must examine the supplier carefully — and scream loudly if he's naked.

# Benchmarking Brainiac 1000

*Artificial intelligence has a tough time just getting past the worm level*

HARVEY P. NEWQUIST III

You may have heard a lot of talk this past year about neural networks, parallel processors, multiprocessors, and other commercial and academic attempts to build computers on a scale closer to the human brain. But one thing you may not have heard much about is what this effort actually means or what the new technologies are really accomplishing.

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recognize one of his own tunes.

Using full stereo reproduction of a particular song, it is able to recognize that each second of information could contain 64,000 bytes of data (you can verify this number by observing how much space a musical sample takes up on a hard disk).

Four seconds multiplied by 64,000 bytes equals 256,000 bytes. Since the Brainiac is outfitted with two ears as input devices, the total number of bytes

of electrochemical impulses. Even though such impulses are notoriously slow — about 100 feet per second — they still outperform electrical impulses over copper conductors, which can travel about one foot per microsecond or a billion feet per second.

The theoretical advantage in the electrical realm is about 10,000 to 1 over the electrochemical processors. Nonetheless, our Brainiac is consistently able to retrieve and correctly identify each song more than 90% of the time. So what gives?

Scale has a lot to do with it. There are some 10 billion neurons in the brain that have an estimated 10 trillion interconnections running among them, with an average lead width of about three microns.

### Brake-wrapping machine

One of the largest and most inspiring multiprocessor computer units on the market today — the Connection Machine from Thinking Machines Corp. — has 65,536 processors with which to manipulate information and is the size of a washing machine. The brain squeezes 150,000 times as many processors into the human skull.

Secondly, the Brainiac can deal with spatial and complex relationships not based on numbers or specific sequences. Even the most expensively benchmarked computer is an autistic human's character, as Dustin Hoffman's character in the movie *Rain Man*. It can calculate as fast as you can get the numbers into it. But try getting it to make a rational decision with no outside help, and the whole system breaks down.

Basically, the argument boils down to one fact: No one knows exactly how the Brainiac 1000 stores information. Thus, memory retrieval as I have described, or as any neural network model attempts to describe, is only theoretically the best.

Why can the Brainiac remember a four-minute song from a decade ago but not remember what it had during a 40-minute breakfast one week before? The answer cannot be found in any computer, even in those attempting to mimic the Brainiac or in the billions of neurons in the Brainiac itself.

The point of this whole exercise is simply to show you how difficult it is to try to replace the human brain with a hardware or software architecture of any type. Under even the simplest of conditions, the brain is still the original computer, and all other models — whatever their performance benchmarks — are imitators that crawl in comparison.

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## SOFT TALK

Stanley Gibson

## Benchmark black magic

 Is it real or is it benchmarking? Why is benchmarking such a joke? One reason is that vendors usually assign the task to their marketing department. A marketing department will approach benchmarking not as the pursuit of truth but as an adjunct to sales.

Typically, any salesperson will marshal numerous facts to promote his product, frequently omitting inconvenient bits of information. The buyer must stay informed to know the right questions to ask and look for the facts that get left out.

Benchmarking works much the same way. The goal is always to construct a test that exaggerates a given product's strengths and minimizes its weaknesses.

Over the summer, DEC internally audited its systems running its DEC TP software. Whatever the results of that test were, we have yet to see them. Why? It stands to reason that if the results were good, then the whole world would have heard about them by now. Instead, some six months after those audits, Peter Marwick is retesting the DEC systems, at a time when some of the hardware has been superseded and more is about to be.

Too often, the auditor is put in the position of watching what

*Continued on page 28*

## A distribution system for spirits

*When importer needed a change, custom 9370 package was low-cost route*

## ONSITE

BY ROBERT MORAN  
CW STAFF

**FORT LEE, N.J.** — When The Paddington Corp. booted up its IBM 9370 Model 60 last month, it was the last step in the spirits and tobacco distributor's search for distribution and financial software and a low-overhead system with its partners' software's interface for the IBM 370.

Paddington, whose primary brands are Jäger Whisky, Baileys and Amaretto di Saronno, is a division of Grandmet Consumer Products, Inc. The rapidly expanding company had outgrown its old system, which was based on a Microdata Corp. minicomputer and a few IBM Personal Computers. The company wanted a new system but wished to avoid the systems programming overhead that developing new systems would entail.

Today, the 9370 Model 60 supports 21 terminals in headquarters and five regional offices

throughout the U.S. It runs everything from accounting to inventory control. In addition, 70 IBM PCs and ATs link the field sales force in regional offices to



Paddington's Greggory

headquarters via modems.

However, when Paddington started out, it could not find distribution control or financial systems that matched the peculiarities of operating in the liquor industry.

Paddington imports spirits

and wines that go directly from suppliers to wholesalers, sometimes from several companies to several locations in the U.S. In addition, some states control the liquor, and they warehouse the products at Paddington's expense. Since those states monitor shipments to liquor stores and draw upon a warehouse, Paddington bills the state.

"Most distribution packages assume the products are imported and then are shipped," said Keith Greggory, Paddington's director of planning and development. "But all of our distribution paths must intersect."

After a long search, Greggory chose to have his software customized. Although financial software was available under IBM's VM/IS, tying it with Paddington's distribution software would have required customization anyway, Greggory said.

Paddington chose the 9370 Model 60 because "The VM/IS operating system is easy to use

*Continued on page 27*

## European users say moving to HP RISC series a breeze

BY JANE LAWRENCE  
CW STAFF

**LONDON** — Upgrading to Hewlett-Packard Co.'s Precision Architecture is like moving from a Model T Ford to a sleek 1989 model, data processing manager Malcolm Kirby says.

"We expected a leap forward in performance, and we got it," he said, noting that the only downside was trading in his HP

3000 Series 33 for a fraction of its original cost.

Kirby's firm, Malone Bacon in North Yorkshire, England, is just one of many Europeans customers that have made the move from traditional RISC machines to the firm's reduced instruction set computing (RISC)-based Precision Architecture.

HP would not give detailed figures but said hundreds have

*Continued on page 25*

## CDC joins graphics parade

BY JAMES DALY  
CW STAFF

**MINNEAPOLIS** — Control Data Corp. became the latest firm to upgrade in the increasingly competitive high-powered graphics workstation market with the recent rollout of a trio of additions to its Cyber 910 line.

The three-angled Cyber 910-600 series uses the power of the MIPS Computer Systems, Inc. reduced instruction set computing (RISC) microprocessor to prevent CDC's high-end line from being left in the dust by its workstation competitors.

Firms such as IBM, Digital Equipment Corp., Silicon Graphics, Inc. and Prime Computer, Inc. offer similar price/performance machines and either sell Silicon Graphics workstations or the MIPS RISC board on which the Silicon Graphics machine is

*Continued on page 25*

## Data View

## Minority automate load management

*A survey of U.S. utilities revealed that more than half haven't automated load management functions and have no plans to do so.*

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## European users

CONTINUED FROM PAGE 25

been sold in the UK, thousands in Europe and tens of thousands worldwide.

The company now sells two Precision Architecture families: the HP 3000 Series 900, which runs the Unix-based MPE operating system, and the HP 9000 Series 800, which runs Unix. In addition, HP still sells two of its traditional architecture systems — the HP 3000 Model 70 with MPE and the Unix-based HP 9000 Model 300 workstation.

The decision to run both Unix and MPE on Precision Architecture machines may be paying off despite past problems. Initially, the MPE-based systems were

delayed while HP ironed out the difficulties of running a proprietary operating system on a RISC machine.

But the effort was considered worthwhile: Existing customers can upgrade to Precision Architecture while preserving their investment in software applications either by running them in emulation mode or recompiling to run natively.

There are also no problems with compatibility, Kirby said. "HP did its homework, and you have to give credit for compatibility. There are hardly any problems with regard to software," he said.

London-based entertainment group Mecca Leisure was a beta-test site and moved from a Model 70 running MPE to a Model 950 running MPE XL.

Systems manager James Cohen was

to HP's migration center for upgrade help, first recompiling MPE to run under the native mode of 950. Most of the code transferred easily, although some needed updating, Cohen said, who warned that the changes must be made before the software is moved to the new system.

Once converted, his system ran between five and eight times faster. Now, Mecca is installing a Unix-based Precision Architecture machine to run a specialized hotel package.

A computer systems manager at a UK stationery company who did not wish to be named was even more cautious in his approach to conversion. When he moved from an HP 3000 Model 52 to a 950 in 1988, he kept both systems running in tandem for two months.

## CDC joins

CONTINUED FROM PAGE 25

based. CDC's workstations are made by Silicon Graphics, in which CDC has a 20% interest.

CDC officials said the Cyber 910-612, 910-622 and 910-624 are based on a design featuring tightly coupled, symmetric multiprocessors with shared memory and offer five times the processing power of CDC's other workstation models.

The 910-612 offers two 16.7-MHz RISC processors and two floating-point coprocessors, while the 910-622 has a pair of 25-MHz RISC processors and two floating-point coprocessors. The 910-624 has four 25-MHz processors and four floating-point coprocessors.

Each 16.7-MHz processor is able to process 13 million instructions per second (MIPS), and each 25-MHz processor can handle 21 MIPS, the firm said.

CDC said it will target the series at industries involved in computing-intensive, graphics-related applications such as computations fluid dynamics, molecular modeling, mathematical theory and computational chemistry.

A new high-speed bus between the graphics processor subsystem and the graphics subsystem results in graphics performance of 400,000 three-dimensional vectors per second, the firm said.

The machines run the Irix operating system — CDC's multiprocessor version of AT&T's Unix System V, Release 3 — and are compatible with Cyber's 910-400 and 910-500 series workstations, CDC said.

Standard software on the 910-600 series will include the Irix operating system, a C compiler and development environment as well as a window manager and graphics library.

The models also include a 182M-byte disk drive as well as 8M bytes of error-correction code memory. Memory can be expanded to 64M bytes on the base memory board.

The 910-612 is priced at \$94,900, while the 910-622 sells for \$114,900. The 910-624 is priced at \$139,900.

## Pharmacy net

CONTINUED FROM PAGE 23

or magnetic strip reader. The system automatically dials up a database located on a Stratus computer at the drugstore's headquarters or at a third party such as Medicare or Blue Cross/Blue Shield. The database is then searched for information regarding the patient's eligibility.

The product, to be marketed by both firms, is targeted at large retail drug stores with \$200 million in sales. However, the application could be used by other health care organizations such as hospitals, insurance firms and health maintenance organizations.

"Most pharmacies in the \$200 million range just take cards with no verification," said Dick Jacobsen, retail industry marketing manager at Stratus. He said large pharmacy chains can justify the investment in the hardware and software in one year.

The cost of the system ranges from about \$79,000 to \$1 million, depending on the configuration, according to Stratus, with the cost being split between hardware and software.

Graphics standard Microsoft® Windows, a product of Microsoft Corporation. Microsoft® Windows is included with all hard disk models of Zenith Data Systems' advanced desktop systems.

## ESA

FROM PAGE 23

ry requirements to move data into expanded memory.

One key benefit, he said, will be to provide faster access to common services in VM. For example, VM provides a common server for advanced printing. When a large number of users are accessing a single common service, a bottleneck can occur. ESA will allow data to be kept in expanded memory.

"There may be 1,000 users, and they may not need huge amounts of data, but they all need to access the same data frequently," McNamara explained.

Romney White, vice-president at Velocity Software, Inc., a Boston-based maker of VM utility software, concurred that this move would serve to boost performance. Currently, data has to be copied from one server's address space to another's. "I'm assuming you could share a data space between virtual machines," White added.

However, he noted that implementing ESA under VM will require users to purchase the expanded memory that will make the added function possible.

"IBM is trying to find a way to sell expanded storage to VM us-

ers," White said. He said users are not clamoring for capabilities of ESA. "This is a solution looking for a problem," he added.

One VM user, who asked to remain anonymous, said ESA capabilities are indeed a blue-sky proposition at this point. "It's an area where we don't know what capabilities we would use." He said improvements under VM/IXA SP 2 offer better CPU utilization and should satisfy his needs for the present.

## More users

According to McNamara, ESA will almost certainly allow VM to support more users. Currently, VM/IXA can handle up to 5,000 users for IBM's Productivity Office System. An ESA version of VM will allow twice that amount or more, he added.

In addition, ESA will allow the number of logical partitions under PR/SM to increase. Currently, VM/IXA SP 2 supports a maximum of six partitions, although up to seven are supported on the largest IBM 3090 S models running MVS.

A VM with ESA will "definitely have Data Spaces," McNamara said. Hierarchies under VM would work differently than under MVS and might thus carry a different name to avoid confusion, McNamara said.

## Spirits

FROM PAGE 25

and compatible with all of the sister companies' operating environments," Greggor explained. However, he said he did not want to incur the additional expense of full-time staff programmers to build and maintain the software.

According to Greggor, the key to the decision was that sister company Carolina Importers Ltd. in Teaneck, N.J., which operates similarly but separately, was in the same position and could share the cost. As a result, each company paid \$600,000 of the \$1.2 million tab for hardware, the customized software and VM/IS. Carolina, however, uses the IBM 9370 Model 50.

Paddington and Carolina decided not to use an IBM MVS-based distribution package developed by sister firm Hadelin, Inc. in Farmington, Conn., which runs it on an IBM 3090 mainframe. According to Greggor, "The MVS statistics would have required the additional cost of reprogramming for VM/IS and an IBM 9370 Model 90." Furthermore, the application "would have required too many people to maintain it."

The other solution, the Distribution Control System from

Arthur Andersen & Co. would have cost about \$200,000, Greggor said. "Communication would have driven the price to over \$1 million and required at least two full-time employees to run the software," Greggor added, "and he would have had to run IBM's DOS/VSE operating system, incurring the additional overhead of system programming personnel."

## Penske's letter

Greggor had both the financial and the distribution systems, which are based on Focus, the fourth-generation database management system from Information Builders Inc. in New York and built by Penske Systems International in New York.

Although the distribution package is completed and running, the financial package will not run until the first week of March. Fortunately, Paddington has a long lead time on orders, which are not scheduled to be posted until the March switch-over. Meanwhile, the orders are being entered into the 9370.

Greggor said that by next year, every employee will have access to the system. He also plans a connection to the company's suppliers in the UK, who support about 60% of Paddington's business.

## Sequoia

FROM PAGE 23

two processors is priced at \$450,000. Both configurations include two 850M-byte disk drives, a 6250 tape drive subsystem and a license for the Sequoia operating system, Topix. The operating system is Sequoia's blend of the AT&T Unix System V operating system and Pick Systems' Pick operating system.

Johnson said the firm has tested the new system with the Debit/Credit benchmark, the evolving standard benchmark being defined by the Transaction Processing Performance Council.

Sequoia plans to make those results available in three months.

Johnson said the company also intends to have the results audited by an outside firm.

According to Johnson, initial

results show that the Series 300

offers 50% more performance

than the Series 200, which un-

derwent benchmark tests last

year.

The 200 performs an esti-

mated 14 transaction/sec. per

processor, Johnson said.

Since it was founded in 1981,

Sequoia has remained a distant

third to competitors Stratus

Computer, Inc. and Tandem

Computers, Inc. in the on-line

transaction processing market.



The best route between your Novell LAN and a mainframe is just ahead.

**Gibson**

FROM PAGE 25

goes on and then simply certifying that he watched it — not that what took place was scientifically correct.

It is as though an auditor sat through a magic show, witnessed a rabbit being pulled out of a hat and then wrote up a report in which he certifies that he saw a rabbit being pulled out of a hat — that is, if the rabbit were indeed a rabbit and the hat were indeed a hat, facts for which he clearly cannot be responsible.

What the user community needs is someone to explain the rabbit-out-of-the-hat trick.

Ready when you are. Early Enterprise Systems Architecture users say that they are finding the system easy to install, but once they have it, what do they do with it? One user proclaimed that he was "positioned for the future." Sounds a lot like an expression that got its start within the hallowed halls of IBM. You may not need it now, but you will be "positioned well" for when you do — as it will be unobtainable by then.

MIS mentor George DiNardo, executive vice-president

at Mellon Bank NA in Pittsburgh, once termed moving to ESA a no-brainer. Without question, it is being done on a large scale by big 3990 shops, particularly those moving to S models.

IBM will be drilling out ESA-based goodies, such as the recently announced Hypercharting. Why not put yourself in a position to use them as they are released? But let's keep track of the flow of goodies to see that there is a generous supply.

Alas, VM will be getting ESA, as indicated elsewhere in this section, but will it be able to support a 3990 Model 3 controller first?

Part of IBM's Feb. 7 announcement was that, indeed, the basic functions of the 3990 Model 3 will be supported by VM/XA SP Release 2. When?

December 1989. Advanced functions were not mentioned by IBM.

"Somebody overloaded something. It's a hell of a way to treat a strategic operating system," said VM guru Romney White of Velocity Software in Boston.

Gibson is Computerworld's senior editor, software.

**Bozman**

FROM PAGE 23

Semiconductor, it will soon be an independent unit of Memorex Telex.

"NAS has not been a very strong force in our marketplace over the last 16 months," said Amadahl President and Chief Operating Officer Joseph Zemke in an analysts' meeting recently. "We've always felt we controlled our own destiny and that we have a unique relationship with Fujitsu. I think our strategy and the execution of that strategy is probably what resulted in NAS being on the block."

Marketing Vice-President Ted Springfield pressed the same point as he commented down an impromptu line of Amadahl's recent "wins." Among the most gratifying of sales, Springfield said, was the displacement of a four-way NAS processor at Baxter Health Care in suburban Chicago. Several Amadahl high-end machines recently went to Mobil Oil and Monsanto — both traditional IBM shops. Other machines were shipped to the Federal Reserve Banks in Boston and Atlanta.

Yet NAS, despite its troubles, is still landing machines in high places. In the last three months, NAS has landed large machines at Delta Air Lines in Miami, McDonald Douglas in St. Louis, Boeing Aerospace in Seattle, Chevron in San Ramon, Calif., and Goodyear Tire & Rubber in Akron, Ohio. It is selling nearly \$1 billion in hardware systems each year in comparison with Amadahl's \$1.8 billion.

**Good for the competition**  
Friendship rivals aside, keeping NAS in the game is actually good for Amadahl's business, says industry analyst Bob Djordjevic, president of Annex Research in Phoenix. Traditionally, NAS has been the price-leader in the IBM mainframe market. But, as part of Memorex Telex, that probably will not be possible anymore, and the market will tighten.

But it seems that the simple act of acknowledging NAS' continuing role as an IBM competitor would underline the fragility of the PCP marketplace. IBM has, by varying analyst accounts, 80% to 90% of the worldwide IBM mainframe market. All PCPs combined — including Siemens AG in West Germany — sell just 11% of all IBM-compatible mainframes.

Outside observers have not

ed that NAS, if folded into Memorex Telex's \$2 billion-plus empire, would make the overall company a \$3 billion PCP giant. That would be a much broader product line than Amadahl's offerings. Memorex Telex executives have stated on the record that such a merger may be the eventual plan. But a full-blown merger will not happen until outside financing is raised to buy National Semiconductor's 50% share in NAS.

Let us hope that, despite Amadahl's rivalry with NAS, Amadahl's recent comments are just a facade. There was one sign, at least, that Amadahl felt some empathy with NAS' new situation. "It's always a little unsettling when one of your competitors is on the block," Zemke said. "We're just glad the deal came down and that all the speculations are over."

Maybe a little more of that competitor would do Amadahl some good. For as Bob Franklin warned those who wanted to go their separate ways on the eve of the American Revolution, "We must all hang together, or assuredly we shall all hang separately."

By Susan L. Rasmussen  
Computerworld's West Coast bureau chief

## RabbitGATE. A faster, more reliable

If you need a fast, reliable, efficient way to connect your Novell LAN to an IBM mainframe, the signs all point to RabbitGATE. No other gateway offers Novell LAN users more performance and flexibility.

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enables inter-LAN gateway access—for SNA, BSC, DPT, and X.25 networks.

And RabbitGATE support doesn't end with Novell LANs. It works as well with NetBIOS LANs. And like all Rabbit products, it provides

NEW PRODUCTS —  
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## System software

Computer Associates International, Inc. has announced Release 5.3 of CA-Backup/TLMS, its automated tape volume and tape data set management system for the IBM MVS operating environment.

Enhancements reportedly include a direct interface to CA-11, the company's automated re-run and tracking system. The software package also includes the extension of expiration date support through the year 2049, the vendor said. Pricing ranges from \$15,600 to \$36,300, depending on configuration.

Computer Associates  
711 Stewart Ave.  
Garden City, N.Y. 11530  
516-227-3300

## Database management systems

A program said to reorganize IBM DB2 databases twice as fast as the supplied DB2 utility has been announced by BMC Software, Inc.

Called DB2 Reorg Plus, the product reportedly provides space management statistics and produces single- or dual-image copies with each reorganization. According to the vendor, the product improves performance and saves costs by reducing CPU cycles.

A perpetual license for DB2 Reorg Plus ranges from \$15,000 to \$51,250, depending on CPU type.

BMC  
P.O. Box 2002  
Sugar Land, Texas 77487  
800-841-2031

XA Systems, Inc. has announced a product for IMS Fast Path database users.

According to the company, IMS-Xpert Fast Path option will enable users to initialize, extract, load, edit and browse information located in the Fast Path database. The option — which works in conjunction with the IMS-Xpert System and software designed for manipulating IBM databases under TSO/SPF, IMS/DC or CICS — is priced at \$10,000.

XA Systems

Building D  
983 University Ave.  
Los Gatos, Calif. 95030  
408-395-1800

Information Builders, Inc. has unveiled a read-only interface between Focus for Digital Equipment Corp. VAX fourth-generation language and database management system and Software AG of North America's Adabas D.

The Adabas interface allows Focus users reporting, graphics, spreadsheet and data analysis facilities to directly access data stored on the Adabas system. The software runs in a DEC VAX/VMS environment and is priced from \$1,750 to \$14,000.

Information Builders  
1250 Broadway  
New York, N.Y. 10001  
212-736-4433

## Development tools

Zantech Information, Inc. announced that its fourth-generation application development environment is now available on the Unisys Corp. U5000 series of VAX-based computers.

Zim is reportedly based on the entire Unisys data model and includes a data dictionary, database query and update and forms manipulation functions.

Pricing for the Unisys U5000 version ranges from \$5,700 to \$37,500.

Zantech  
1200-38 Antares Drive  
Ottawa, Ont. Canada  
K2E 7V2  
613-727-1397

## Languages

Oregon Software, Inc. has announced that its Pascal-2 compiler is available for Intel Corp.'s 80386-based machines running the Xenix operating system.

Pascal-2 Version 2.2B Xenix/386 reportedly includes a debugger, assembly language interface, source-code formatting and procedure cross-referencing capabilities. The latest release costs \$995 for a single-user license and \$250 per year for support services.

Network licenses are also available.

Oregon Software  
6915 S.W. Macadam Ave.  
Portland, Ore. 97219  
503-245-2302

Philon, Inc. has released Philon Fast/Cobol 1.5, a language compiler for Motorola, Inc. 68000 series-based systems running under Unix.

The latest version reportedly conforms to ANSI standard-

based Cobol X3.23-1985. The vendor said the product has been undergoing National Institute of Standards and Technology validation at the intermediate level since January, and a full high-level release is planned for release in the second quarter.

Philon Fast/Cobol 1.5 costs \$2,200.

Philion  
641 Avenue of the Americas  
New York, N.Y. 10011  
212-807-0363

## Applications packages

Prime Computer, Inc. has released Conservation Code 4X Revision 4, a computer-aided design system.

According to the company, the product provides integrated nonuniform rational B-spline geometry and solids modeling capabilities.

Features include the automatic execution of solids modeling operations, the ability to cut a solid with a sculptured surface and a production visualization package.

Code 4X Revision 4 is priced from \$10,500 for software only.

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Prime Park  
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# The Terminal Of The '90s Has Arrived A Bit Early.

**Wyse introduces the WY-150.** They always said there would be such a terminal "someday". It would have the flexibility and connectivity to operate in virtually any computing environment, while meeting the most exacting ergonomic requirements. And, it would deliver those advantages at an affordable price.

"Someday" is here much sooner than expected.



It's called the Wyse WY-150, a breakthrough in terminal technology that will set price/performance standards for years to come.

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The WY-150 also sets new ergonomic standards. Its 78 Hz refresh rate, eliminates any hint of flicker. Just as overscanning and a bezel that matches the soft, paper white phosphor erase distracting borders. (Amber and green phosphors are also available.) The oversize 10x16 cell makes each crisp character stand out vividly.

The WY-150 is also part of *System Wyse*. It links effortlessly with Wyse PCs and multi-user platforms to create uniquely

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# MICROCOMPUTING

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Douglas Barney

## Lotus lockup period to end

Lotus' cone of silence. For much of its history, Lotus has been close-mouthed about new products and future strategies. Getting information was worse than pulling teeth — at least teeth usually come out.

In April 1987, the company tried an experiment. At its annual shareholders' meeting, the firm unveiled ambitious plans: Lotus' 1-2-3 Release 3.0; 1-2-3/M, along with a 10-year co-development agreement with IBM; 1-2-3/G; and perhaps most surprising, Lotus/DBMS, an advanced multilayer database with an array of graphical front-end tools. It also talked about Symphony 3.0, a version of the five-function beast that will use 1-2-3 Release 3.0 as its core.

This orgy of preannouncements was followed by a week of demonstrations and festivities called Lotus Week. This was the new, open, likable Lotus.

The company has been trying to live down that tumultuous day ever since. That is because, nearly two years later, none of the important stuff announced at Lotus Week has shipped, a situation that has earned the firm

*Continued on page 37*

## OS/2 users search for puzzle pieces

BY DOUGLAS BARNEY  
CW STAFF

After more than a year of availability, there is a host of corporate users anxious to get cracking with OS/2.

But these pioneers, with development projects already underway, are still waiting for all the pieces to come together, users said in recent interviews.

Here is what users said they need most:

- Key applications for OS/2 character and graphics modes.
- Broader distribution of Microsoft Corp.'s OS/2 LAN Manager and IBM's LAN Server.
- Lower memory and hardware prices.
- Ashton-Tate Corp./Microsoft/

Sybase, Inc.'s SQL Server and other database server technologies.

A Microsoft spokesman said the company is one of many users who have essentially completed internal OS/2 applications. Host International, Inc. chose OS/2 for its 110 airport snack and gift shops to gain large memory and multitasking. Once it is up and running, end users will be able to do background processing.

"We have had a lot of instances where someone will have to shut down the system to let someone else do something," McLean said. That will end with OS/2.

But because Host's account-

ing system is tied into a variety of off-the-shelf MS-DOS applications, McLean must wait for OS/2 versions of tape backup, word processing and spreadsheet software. "Until they get here, we won't install it," he said. McLean said Host hopes to have the system in production by the third quarter, software vendors willing.

A. C. Nielsen Co.'s Nielsen Monitor-Plus in Wilton, Conn., also has ambitious plans for OS/2. Its main task is to track and analyze the impact of television commercials.

Project manager Rick Martin is spearheading the downscaling effort that will eliminate the need for the firm's Amstrad Corp. mainframe within two years. An-

choring the final stage of the downscaling will be the SQL Server or that runs under OS/2. Martin is still waiting for the spring release of SQL Server and the second-quarter release of Sybase's screen tools.

Once these products are available, Martin and crew will

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### Insider

• IBM low-end systems

overheat stays the course.

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• Apple discounts high-end models' prices. Page 35.

• Vidextek releases electronic photography combo.

Page 43.

## Cornering the stock market

Micro vendors vie for brokerage desktop spots

BY WILLIAM BRANDELL  
AND DOUGLAS BARNEY  
CW STAFF

Wall Street is not just a hotbed of trading activity: It is also a hotbed for vendors of high-performance desktop computers.

These firms are currently trying frenetically to carve a slice of the lucrative trading market.

Although there is an array of offerings, the market is clearly dominated by IBM and its array of personal computers with graphical user interfaces. However, brokerage firms handle many different types of trading, requiring different types of sys-

tems. Thus, PCs may never replace every Quotron Systems, Inc. terminal or high-end workstation. They may, though, ease out the majority.

### PC allure

Part of the PC's allure is software. A hot player in this market is New York-based Miltex, Inc., a firm that has made steady inroads on Wall Street. Its products are what the company claims to do: allow the user to take in real-time information using Lotus Development Corp.'s Signal and dump the information into pop-up windows using Microsoft

*Continued on page 47*

## Exec info systems catch on

BY MICHAEL ALEXANDER  
CW STAFF

The software industry is readying to put senior executives online with executive information systems (EIS) in a big way, according to a recent study conducted by International Data Corp. (IDC).

Several information technology executives said they are seriously evaluating EIS but that software vendors will have to do

a better job of tailoring their products to the needs of their executives and to personal computer-based networks.

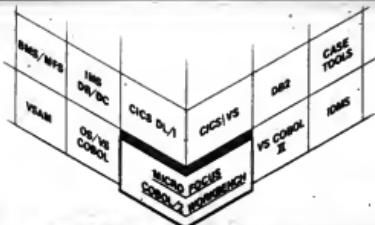
IDC, a Framingham, Mass.-based market research firm, predicted that the U.S. market for EIS will grow at a compound annual rate of nearly 40%, up from \$22 million in 1987 to \$115 million in 1992. (See story page 130.)

IDC noted that expenditures for EIS software development, including the purchase of software, custom consulting and hardware, software development, will climb to nearly \$350 million in 1992.

Executive traditionally have been reluctant to devote valuable time to learning and developing their computer skills, but

*Continued on page 49*

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## SMALL TALK

Michael Alexander

## It's never too late to learn



A friend called me recently. He's a top executive at a luxury hotel that had been in the midst of undergoing a significant — several million dollars' worth of renovation. For more than a few months, he has been dealing with selecting and installing a costly computer system for the hotel's front-desk operations.

After we had lamented the end of the football season, compared the weather on each side of the country and exchanged other pleasantries, my friend began recounting his difficulty with making sense of all of the new technology he has been forced to absorb.

He has had to talk to dozens of vendors, compare several bids, even attend classes to get a better fix on what is considered state of the art in the hotel business. He admitted that many times he has been utterly baffled by the technology.

During our conversation, he asked me whether I thought he should personally hire a desktop consultant. "After all, I can hardly be expected to be a tyro, but on the other hand, I can't help but think that it would be easier for me to understand the hotel's computer needs," he said.

After mulling it over for several seconds, I replied that I

*Continued on page 40*

# IBM's new low-end systems president stays the course

BY WILLIAM BRANDEL  
CW STAFF

BOCA RATON, Fla. — In many ways, IBM's new Entry Systems Division President James Cannavino is like U.S. President George Bush. In both cases, staffers speak of a "kinder, gentler" approach.

But like any high-ranking politician, Cannavino must sell a skeptical industry on an ambitious strategy, which in this instance includes selling a memory-demanding OS/2 and OS/2 Presentation Manager operating system component. Entry system prices are still high. Most users continue to balk at the expense of upgrading to an operating system that has precious few important applications. That will not change until DRAM becomes viewed as a nice four-letter word again.

As the successor to William Lowe, a long-standing IBM executive, Cannavino also speaks

of staying the IBM Personal System/2 course. Part of that message includes the reiteration of the overall Micro Channel Architecture (MCA) strategy. Cannavino said that the MCA will improve in an evolutionary, compatible manner. In short, there will be no new Micro Channel, as published reports had speculated.

In other words, expect business as usual in IBM's low-end systems product strategy under Cannavino. "I don't see any major changes in store," Cannavino said. "We are investigating the Boot Room facility last week. In fact, most believe that IBM's most dramatic Personal Computer announcements, such as OS/2 and the MCA, have already been made."

### Coming-out party

The week marked Cannavino's coming out, his first major public appearance since succeeding Lowe in December. The

straight-talking Lowe resigned as president of the Entry Systems Division to take an executive position at Xerox Corp.

When Cannavino's promotion was announced, IBM corporate customers were still anxious to see a compelling reason to switch to the MCA, such as add-in boards that would provide previously unused capabilities. They also wanted to learn how the PS/2s they had already purchased fit into IBM's Systems Application Architecture umbrella. These two issues are only slowly being explained by IBM.

Cannavino acknowledged that the new MCA-based products are in the offing. These include systems using the Intel Corp. 80386SX processor as well as a laptop using the MCA. Further details were not forthcoming.

### Dangerous approach

While analysts speculated that Cannavino's mainframe background had led him to repositioning of the personal computer in IBM's strategy, that is not entirely the case. Cannavino, however, did caution that PCs should interact with mainframes in fairly limited ways.

For instance, Cannavino cited the danger inherent in "notions that workstations would have direct access to mainframe operations."

"When you give the PC direct access to the mainframe, you are interrupting six tons of muscle to let it know that you hit a key,"

That is not efficient use of a network or your mainframe," Cannavino said. "You want your mainframe to be mainframe." He added that with the proper interface role definitions, mainframe applications will not cannibalize IBM mainframe sales but complement them. This runs contrary to the downgrading pundits who credit PCs with the certain demise of the mainframe.

Despite being coy about IBM's plans to create synergy between mainframes and microcomputers, Cannavino hinted of things to come. "We are right on the edge of an expansion of the PS/2 family. In 1989, it will become obvious why we did what we did with the Micro Channel. Soon you will be able to drop in a bus master card that will make a Model 50 perform like a Model 70."

The new IBM PC chief argued that customers are not displeased with the quantum leap from Personal Computer AT-based systems and said there are no plans to ever discontinue the AT line. "We have had very little — if any — reaction from our customers saying, 'You did the Micro Channel thing wrong.' But nor are any of us going to give up the AT market opportunity," he said.

As Lowe did, Cannavino argued that upcoming versions of the PS/2 will support multiple users on a single hardware platform. "You get a system as sophisticated as OS/2, and multitasking is not a long way to go," he said. And like Lowe, Cannavino was vague in laying out the details of OS/2's multitasking strategy.

## Data View

### Driving up and down

By 1991, shipments of microfloppy disk drives are projected to outnumber those of 3½-in. drives by a margin of almost 3-to-1



SOURCE: DRIBBLE/TREND, INC.  
CWT CHART: DODD/SHAW/DAHL

# Apple continues to slash Mac prices

Discounts offered to high-end users buying in volume, through resellers

BY JULIE PITTA  
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. has taken another stab at lowering prices for higher end models of its Macintosh personal computers through new discount programs for end users.

According to an Apple spokeswoman, peripherals for the Mac have been dropped in price by up to 50% for customers who buy through resellers. Further, customers who buy through resellers will receive a rebate. The discount applies to the Macintosh II and Macintosh

IIx, the Macintosh SE and the Apple IGS line.

National accounts — users who buy in volume — will receive a 10% discount per each large order. For example, a national account will receive a free Macintosh II with a 40M-byte hard disk drive for every four Mac IIs it buys. Customers who purchase Mac SEs with dual floppy disk drives will receive a free system for every 11 units they purchase.

**Peripherals too**  
High-end peripherals and systems are eligible for better discounts under the program.

"We're attempting to achieve parity between the two programs," the spokeswoman explained. "It will be their choice whether they purchase through the dealer or through Apple; they won't be penalized for either decision."

Both promotions will be in effect until March 31.

Apple is attempting to redirect sales toward more fully configured systems in its product line, the spokeswoman noted. Last summer, Apple raised prices for its more fully featured Macs by between \$400 and \$1,100. The price hike was greeted with widespread criti-

cism from Apple customers.

As a result, demand shifted toward Apple's less expensive, less fully configured Macintoshes. At the same time, Apple began pushing entry-level computers at industry-high prices as an attempt to meet customer demand.

Subsequently, prices for dynamic random-access memory began to decrease, leaving Apple with its stockpiles of expensive memory chips and customers who wanted stripped-down Macs.

**Revenue decreases**  
Apple reported that revenue is expected to drop in the current quarter because of the price increases and the decision to stockpile memory.

In January, Apple made its

first move to alter customer buying patterns, trimming prices on higher end Macs and peripherals.

Mike Bailey, president of Apple Professional Exchange and a systems integrator at Lockheed Missiles and Space Co., said price reductions are a step in the right direction.

"They're trying to stimulate sales," Bailey said. "They've made some tactical errors and now they're trying to do some damage repair."

"They're especially trying to stimulate more activity in the corporate market," he continued. "I think they turned off some large customers with the increases last year."

However, Bailey said Apple salespeople have yet to approach him regarding the discount.

## OS/2 users

CONTINUED FROM PAGE 31

complete the job of porting both local-area network and mainframe applications to SQL Server.

NASDAQ, Inc. has completed work on an OS/2 server-based application for software distribution. The program, aimed at systems administrators, will distribute the software to 1,400 traders. The server will hold data files and program files for users and will provide the most up-to-date software for each. Unlike other firms, NASDAQ has all the pieces it needs.

NASDAQ's OS/2 application will save the first time, effort and money. Today, whenever there is an update to the workstation software, NASDAQ's MIS staff has to produce and distribute 1,400 floppy

disks, many with specific configuration information, which takes five to seven days, Flynn said. Once the OS/2 network is up and running, the task will take 45 minutes. The firm also plans to begin designing a system that will bring OS/2 and eventually IBM and Microsoft's OS/2 Presentation Manager, to traders' workstations. There is no time frame for these projects.

Microsoft Windows advocate Art Block is willing and anxious to move to OS/2. Block's Intel Corp. 80386-based micros with high-resolution graphics and 4MB to 8MB bytes of random-access memory are already ready. The manufacturer, however, is not. Vice-president said he is simply waiting for OS/2 Presentation Manager applications. Like so many other pieces, there is no telling exactly when these applications will arrive.

## Barney

CONTINUED FROM PAGE 31

a reputation for putting its vapor where its mouth is. The only thing that has changed since then is the company's image.

For a while after Lotus Week, the firm was still forthcoming. It announced Blueprint, a communications protocol, 1-2-3/Mac, and a version of 1-2-3 for DEC's VAX.

### Forget what we sold

But the product delays have hurt Lotus badly. And, it seemed, every time the company announced a product, the press and competitors would simply point to all the unannounced ones. Lotus would prefer we forget that series of overseas announcements. In fact, we often do and have to look up old press releases to remember what was said so long ago.

Lotus is not entirely blameless for its delivery problems. Lotus/DBMS and 1-2-3 both require the IBM and Microsoft OS/2 Presentation Manager, an environment that may still call unstable. Release 3.0 was developed largely under OS/2 and has had difficulty fitting back into the lesser confines of MS-DOS. These factors have made Lotus no less sensitive to the herbs that are a part of everyday life for key company execs.

So Lotus has gone back to its roots and decided to shut up. It isn't on the front page anymore. It isn't even on the back page. It is simply hiding its time, waiting to ship some stuff so it can start to brag again. Like Ronald Reagan, the company apparently prefers no press to bad press. In short, Lotus has gone dark.

This is not entirely bad. But it is not entirely good either. You see, customers still need information about when things are coming, what they will look like, what they'll require and how much they'll cost. Lotus is barely talking about products it announced nearly two years ago.

### Another pretty interface

For instance, I like database software. I don't really use it. I just like to look at it. If I want to simply look at a prototype of Lotus/DBMS, I have to sign nondisclosure agreement. If I ask how much room I'll have in a 640K-byte machine for a spreadsheet under Release 3.0, I still get a "no comment." Even some large corporate customers are getting this silent treatment.

Lotus won't keep quiet forever. At every corner of the company, groups are excited about their projects and anxious to talk. But the pressure on employees to keep things secret is so immense that some have coined the new corporate slogan, "Loose Lips, Pink Slips."

The corps started to pay out last week when the finally announced beta shipment of 1-2-3 Release 3.0. But information is still slow to come out. Even though disks are finally out to users, no one seems to have yet sat down in such detail as what the system will require: an IBM Personal Computer AT or above and how much memory will be needed to get some useful work done. From there, there are just a few more areas in need of elaboration, such as Lotus/DBMS, 1-2-3/G, 1-2-3/Mac, 1-2-3/VAX and Symphony 3.0.

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Barney is a Computerworld senior editor, microcomputing.

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## Info systems

FROM PAGE 31

new technologies are shortening the training time. Graphical interfaces, mice, touch screens and other tools enable executives to quickly learn how to use information systems, IDC researchers said. Not only do these tools make it easier for execu-

tives to use information technology, but they also flatten the learning curve, making the process more economical, according to IDC.

MIS is finding it easier to design EIS programs, thanks to the increasingly widespread availability of powerful application development programs and relational database technology, IDC reported.

"In a nutshell, its time has come," said Lloyd Belcher, coordinator of executive information systems at Conoco, Inc. in Houston. "The components that have been brought together are technology, namely the PC and local-area networks, and a realization that information is a commodity."

There is also the awareness on the part of executives of the

value of information as a competitive weapon, he added.

"Classical mainframe orientation was toward getting large reports to an executive rather than just the important pieces of data," Belcher said.

Conoco has spent five years developing and refining its EIS, according to Belcher. "It has not been totally painless," he conceded. "The interesting thing is

when you start, the executives don't know what they want."

Information systems managers have learned from past mistakes in efforts to implement EIS. Often, an EIS failed because of the inability of executives "to describe an indescribable product," Belcher said.

### Software lacking

While most IS managers agree that the hardware technology is adequate for EIS, the available software is lacking.

"From the point of view of MIS, the software is really not there yet," said Howard Campier, data center director at Ashland Oil, Inc. in Lexington, Ky. "It's a question of, do you want to roll your own environment and have to maintain it for the rest of your life or wait for the commercial stuff? When we last looked at it a few years ago, we weren't satisfied. We're looking at it again now, though."

Much of the available com-

## Alexander

FROM PAGE 35

could not see how he has managed to get by so long without a personal computer on his desk.

Given the competitive nature of the hotel industry and the demands of harried business travelers who want to check in and out at blinding speed, choosing the right computer system has long-term, strategic importance for the hotel. It's a big-money decision that only comes after considerable deliberation.

If you had at least a working knowledge of PCs, it would go a long way toward helping you make the bigger decisions on how to strategically use information technology, I said. Using PCs may be the right technology that you can learn what information technology can and cannot do.

What I mean, I said, your use of a PC, even if only occasionally or for a specific task, sends a message to every staffer — especially the executives who report to you — that using information technology is vital to the hotel's competitiveness.

I am familiar enough with my friend's job to know that much of his time is spent poring over spreadsheets that detail room occupancy rates, food and beverage sales, salaries and benefits and similar information. When the numbers don't jibe or when he decides that he hasn't had enough "what's" to power through, he subscribes to various news services on a PC and peruses news agencies' reports. It usually takes a few days before all of the information my friend needs is back in his hands.

I told him that if he knew at least enough about PCs to manage numbers in a spreadsheet,

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mercial software is not adequate, concurred Tim Crowell, vice-president of the LAN group at NCNB Texas National Bank in Dallas: "Most of what we have seen is mainframe-oriented." The bank is in the midst of evaluating a variety of packages and intends to implement an EIS by year's end, Crowell added.

"What we have determined from our managers is that they only want specific pieces of information, and the mainframe-types of reports are just too large," he said. "It definitely has value to us, but the executives have only so much time for decision making, and they need to do it on a specific set of information on a system designed for them."

EIS may not be the best approach for increasing the information flow among all executives, IDC warned. Some of the factors to consider are the competitiveness of the business environment and the value placed on information as a resource.

It would not only save him considerable amounts of time, it would help him make quicker decisions.

The hotel business is bound to get tougher, especially in the nation's biggest cities where there are more hotel rooms than bodies to fill them. The demands at the front desk are probably going to be small compared with the demands in the executive offices, I said.

Not being able to type, of course, is an excuse that many executives use in an attempt to mask their fears of having to learn something new or as challenging as using information technology.

I know quite a few exceptional fine writers who cannot imagine what life was like before word processing, yet can barely find the top row of keys on a keyboard. My friend is really no different than they are; he just doesn't know it yet.

I suspect that many information center managers know executives in their companies whose attitudes toward PCs are quite similar to those of my friend. Unfortunately, it is easier to buy into the argument that executives don't want to learn how to type as the reason for not putting PCs in top offices.

But what is apparent to me is that at companies in which end-user computing is burgeoning, the push for using PCs strategically is coming from top down. I don't think that my friend will order a PC for his office any time soon. But I think he now recognizes that the value of using a PC is not solely in being more productive but in the understanding of the technology and how it is used outside the executive offices.

Alexander is a Computerworld reader editor, [www.computerworld.com](http://www.computerworld.com).

## Cornering

FROM PAGE 31

Corp.'s Windows. The users can then reconfigure the menu or interface as they deems to perform market data applications such as real-time analysis.

As each broker has his own "feel" for the market, he can configure the analysis using whatever real-time or historical data he considers significant. The information that he pulls up is used to determine if and when he will perform a stock or bond transaction.

**Fidelity Investments.** Boston-based Fidelity Investments is now implementing a system based on the Muxtek approach. Using the Muxtek menu, a bond salesman can address historical data on both the market and the client to assure that redundant phone calls have not been made.

The salesman also knows what information has been sent to that particular client. Fidelity is implementing the system on an IBM Personal System/2.

One of the important features of the Fidelity approach is the use of Muxtek's IBM 3270-based terminal emulation product. Using the terminal emulation in a pop-up window, the user has direct access to information on the mainframe. This means that computing-intensive applications such as a database search are processed on the mainframe, while the remainder of the activity can be done on the PS/2.

**Goldman, Sachs & Co.** Goldman Sachs is also using Muxtek

software. Using the menu, Goldman Sachs traders can pull up different market data sources, perform analysis, read "pages" of market information and access data from in-house computers. Goldman Sachs is using this technique to replace costly dedicated terminals.

**Merrill Lynch & Co.** This Wall Street fixture has a variety of workstation approaches depending on the needs of specific traders. Goldman Sachs is using this technique to replace costly dedicated terminals.

**T**HE IDEAL workstation will have the ability to access different hosts, multiple data services and will need good presentation capabilities.

ters staff will be using PCs with Windows that will primarily focus on finance and accounting applications, said Gordon Solars, vice-president of distributed systems.

Most likely customers at the firm will need likely on high-end workstations from vendors such as IBM, Sun Microsystems, Inc. or Digital Equipment Corp. For these highly demanding applications, the hardware is chosen on an almost case-by-case basis, said Dan Trojans, vice-president of equity trading systems. As a result, Trojans is looking at the most open elements possible, including X11, ANSI's X.11 as a windowing standard, Transmission Control Protocol/Internet Protocol for networking and C as the programming language.

At the firm's municipal trad-

ing group, however, a PC system using Windows has been in place since 1987.

**NASDAQ, Inc.** NASDAQ traders are currently using PCs with a customized multitasking system that sits on top of MS-DOS, said Ed Flynn, assistant director of software development at NASDAQ. The organization plans to stick with the tried and true Intel architecture but will boost functionality with eventual moves to more sophisticated op-

erating systems. Chief among the operating systems candidates are Windows, OS/2 and Microsoft and IBM's OS/2 Presentation Manager, Flynn said. The goal for the new systems will be to let OS/2 Presentation Manager, while diskless workstations tied to servers will most likely run Windows, Flynn said.

**Prudential-Bache Securities, Inc.** Prudential-Bache is a brokerage house in transition. It currently has a variety of trading systems but is developing a plan for a more unified future. "Today, they have all kinds of systems," said Mohammed Moosad, senior vice-president of information systems, operations and support at Prudential-Bache. "They don't have one integrated device."

According to Moosad, the ideal workstation will have the ability to access different hosts, multiple data services and will need good presentation capabilities. Prudential is leaning toward the Intel Corp. architecture running OS/2 and OS/2 Presentation Manager, Moosad said. The decision will be made in six months to a year.

**New York Stock Exchange.** The floor of the NYSE is a hectic and crowded place. In fact, space is at such a premium that phones have had to be repackaged and shoved into smaller containers. The same thing goes for computers.

Away from the hustle and bustle of the trading floors are customized Intel 80286 and 80386 computers locked in closets. All the trader sees is a color display or fast-paced device that provides the needed stock information, said Joel Beier, vice-president of capital markets technology at the NYSE.

Within the so-called trading booths, there is even more room. Because there is hardly any room for a keyboard, touch-screen devices are the rage. These systems are tied to remote DEC VAXs.

The organization is looking at installing intelligent workstations right where the stock specialists sit but is still grappling with the space constraints. If anyone has developed a high-end microcomputer the size of a shoe box, give Joel Beier a call. Beier is working with even smaller devices. The NYSE is currently testing a handheld version of the PC.

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## NEW PRODUCTS

## Systems

Iverson Technology Corp. has announced three ferment personal computer systems based on the IBM Personal System/2 Models 30, 50 and 60, the company says.

Two of the systems, the ITC PS 30T and the PS 50T, are reportedly approved for the federal government's Preferred Products List. The third product, the ITC PS 60T, was designed to meet the Nucain 5100A specification.

Prices start at \$3,000 for the PS 30T, \$4,325 for the PS 50T and \$6,600 for the

PS 60T. All include a 90-day warranty. Iverson Technology  
13560 Beverly Road  
McLean, Va. 22106  
703-749-1200

A 25-MHz Intel Corp. 80386-based portable computer is now available from Dutch Computer Systems.

The Dutch-PMC is reported to be an IBM Personal Computer AT-compatible system with 64K bytes of disk-caching and a zero-wait state microprocessor. The system incorporates six expansion slots and both serial and parallel ports. Pricing for a unit with 4M bytes of ram-

dom-access memory and a 40M-byte hard disk starts at \$9,495. Dutch Computer Systems  
2029 O'Toole Ave.  
San Jose, Calif. 95131  
408-435-1881

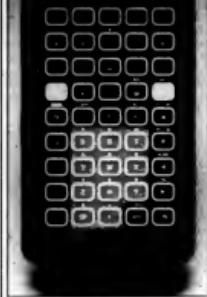
A handheld personal computer has been unveiled by Corvallis Microtechnology, Inc.

Dubbed the MC-V, the Intel Corp. 80386-based unit reportedly weighs 26 ounces and offers support for several programming languages and software platforms. The system is targeted at professionals in engineering, land surveying, forestry, medical records management and sales-route accounting.

Standard features include 256K bytes

of random-access memory, two RS-232 interfaces and an internal heater. The MC-V costs \$1,450. Corvallis  
895 N.W. Grant Ave.  
Corvallis, Ore. 97330  
503-753-5456

CMT 1



Corvallis' MC-V

Epson America, Inc. has introduced the Equity IE desktop computer for business and personal applications.

According to the company, the small-footprint computer can be used stand-alone or as a network workstation. Standard features include four expansion slots, an Intel Corp. 80386 microprocessor with selectable clock speeds of 8 or 10 MHz, and an IBM multiple Color Graphics Adapter interface.

The system is available in three configurations: a single 3½-in. floppy disk model priced at \$1,149, a dual 3½-in. floppy drive version priced at \$1,349 and a combination 20M-byte hard disk and 3½-in. floppy disk drive configuration priced at \$1,749.

Epson America  
23530 Hawthorne Blvd.  
Torrance, Calif. 90505  
800-923-8911

### Software applications packages

Hewlett-Packard Co. has released another version of its HP Graphics Gallery software for industry-standard personal computers.

Versa 3.0 reportedly provides compatibility with the computer graphics metafile format. The software package consists of two components: the HP Charting Gallery for creating presentation-quality charts, and the HP Drawing Gallery for creating and editing text, illustrations and charts.

Each package is available separately or as part of the collection. Pricing ranges from \$249 to \$499 for first-time users,

and upgrades range from \$75 to \$125. **Hewlett-Packard**, 3000 Hanover St., Palo Alto, Calif. 94304 800-752-0940

A combination hardware and software product designed to produce electronic photography on personal computers is now available from Videotex Systems, Inc.

**Video Publisher** reportedly consists of a 512- by 512-pixel resolution digitizing board capable of capturing analog video at 256 gray levels. Images can be saved as encapsulated Postscript, TIFF or PCX files and imported directly into virtually any desktop publishing package, according to the vendor.

The product operates on IBM Personal Computers, PC XTs and ATs and compatible computers and is priced at \$995. **Videotex**

**Suite 205**  
8499 Greenville Ave.  
Dallas, Texas 75231  
214-346-4560

**GW Instruments, Inc.** has released Version 3.0 of Parameter Manager Plus, its data acquisition spreadsheet software for Apple Computer, Inc. Macintosh computers.

The software package was developed specifically for scientists to collect, analyze and display data, according to the company, and the enhanced version provides additional data-smoothing features and larger graph sizes — up to 400 by 400 in. The product can now handle as many as 32,767 graphs from a single data set and is priced at \$990. **GW Instruments**

**35 Medford St.**  
Somerville, Mass. 02143  
617-625-4096

A text editor for personal computers running MS-DOS or PC-DOS operating systems is available from Andrew M. Saucci Jr.

Called **Deevwriter**, the software is a single-screen text editor suitable for creating short memo notes and batch files, according to the vendor. Features include a nonblinking cursor and automatic word wrap functions. The product requires 256K bytes of memory and is priced at \$60 until April 1 and \$75 after that date.

**Andrew M. Saucci Jr.**  
727 Barkley Ave.  
E. Meadow, N.Y. 11554  
516-538-9209

**Distribupro**, the maker of Accounting by Design, has announced a price increase for its Client/Write-Up software introduced last April.

The general ledger package for professional accountants originally carried a price of \$995. Version 2.0 of the product now costs \$1,295, according to the vendor.

**Distribupro**  
2034 Bearng Dr.  
San Jose, Calif. 95131  
408-436-7499

A C language programmer's tool kit has been introduced by Effective Data Solutions.

**ZipperNet** reportedly maintains a data file of U.S. ZIP codes and related geographic information, including city, state and county names and area code information. It requires less than 1M byte of storage and runs on IBM Personal Computers and compatibles.

*Zip@here*.costs \$139. **Effective Data Solutions**  
Suite 102  
28225 Agoura Road  
Agoura Hills, Calif. 91301  
800-777-8818

### Software utilities

A DOS driver that was designed to double the capacity of both hard and floppy disks has been introduced by Sundog Software Corp.

Called **Squish Plus**, the logical device driver is said by the company to be completely transparent and can compress files of up to 512M bytes.

The product runs on stand-alone IBM Personal Computers as well as compatible workstations and can operate with 3Com Corp. or IBM PC Network file servers.

**Squish Plus** costs \$99.95 and requires 365K bytes of random-access memory.

**Sundog Software**  
264 Court St.  
Brooklyn, N.Y. 11231  
718-855-9141



**United Software Security's PC Librarian**

United Software Security, Inc. has announced the release of an intelligent utility for IBM Personal Computers, Personal Systems/2s and compatibles.

The program, which is called **PC Librarian**, is designed to remove inactive files from the PC while retaining a catalog of information pertaining to the removed files on the hard disk, the company said.

The software requires a minimum of 512K bytes of internal memory and is priced at \$99, according to the company.

**United Software Security**  
8133 Leesburg Pike  
Vienna, Va. 22180  
703-556-0007

A software package that allows personal computer users to program their computers to automatically perform routine tasks is now available from **Complementary Solutions, Inc.**

The program, which is called **Automate**, the product reportedly performs file backup, report printing and batch job scheduling automatically and according to a predetermined schedule. Operator intervention is not required. The software is priced from \$200 to \$250.

**Complementary Solutions**  
Suite 202  
4470 Chamblee-Dunwoody Road  
Atlanta, Ga. 30338  
404-454-8033

Microsoft Corp. is currently offering **Docucomp**, a document comparison program from Advanced Software, Inc., free of charge to Microsoft Word 4.0 users.

Docucomp uses pattern recognition technology to compare two versions of a document and report changes, according to Advanced Software. It is available for other word processors in both networked and single-user versions and is priced at \$159.95 plus shipping and handling.

**Advanced Software**  
Suite 212  
1095 E. Duane Ave.  
Sunnyvale, Calif. 94086  
800-346-5392

### Macintosh products

Xerox Imaging Systems has announced a text-scanning software package that provides intelligent character recognition (ICR) for Apple Computer, Inc. Macintosh-compatible scanners.

**Datacopy Accutext** utilizes ICR technology to capture virtually any typeface in complex documents and convert it into documents with word-processing commands, according to the vendor. It reportedly boosts the accuracy of desktop scanning systems available for the Macintosh II and the Macintosh SE with a Motorola, Inc. 68020 accelerator card.

The software requires 4M bytes of system memory and is priced at \$995.

**XIS**  
1215 Terra Bella Ave.  
Mountain View, Calif.  
94043  
415-965-7900

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A voice-recognition system developed specifically for use with the Apple Computer, Inc. Macintosh SE has been announced by Articulate Systems, Inc.

Dubbed the Voice Navigator, the combination hardware and software product includes a built-in microphone, speaker and sound controls and responds to the user's voice in the same manner as a keyboard responds to touch, the vendor said. The system reportedly connects to the computer via the small computer systems interface port.

The Voice Navigator is set to ship in the second quarter and is priced at \$995. Articulate Systems  
99 Erie St.  
Cambridge, Mass. 02139  
617-876-5236

A video card for the Apple Computer, Inc. Macintosh SE has been introduced by Mobius Technologies, Inc.

Called Multiscreen, the product reportedly allows users to attach a variety of full-size monitors to the Mac SE system. It consists of a video board and software for multiple resolution display and is priced at \$495.

Mobius Technologies  
6020 Adeline St.  
Oakland, Calif. 94608  
415-654-0556

A 21-in. monitor developed for use with the Apple Computer, Inc. Macintosh II is now available from Monitron Corp.

The Viking 21 provides a square, flat screen designed to provide a larger dis-

play area and reduce glare pickup from overhead or peripheral light sources, the vendor said. The product displays 256 colors out of a palette of 16.8 million, weighs 78 pounds and costs \$3,795.

Monitron  
5740 Green Circle Drive  
Minnetonka, Minn. 55343  
612-935-4151

### Peripherals

In Focus Systems, Inc. has announced a line of PC Viewers designed to add high-contrast black-and-white projected images to the company's current blue and yellow display products.

The viewers reportedly allow presentations developed on a personal computer

to be magnified and displayed directly on an overhead projector, eliminating the need for traditional overhead foils.

Reportedly compatible with IBM Personal Computers and Personal System/2s as well as Apple Computer, Inc. Macintosh and Apple II machines, the PC Viewer line has a price ranging from \$895 to \$2,995.

In Focus Systems  
7649 S.W. Mohawk St.  
Tualatin, Ore. 97062  
303-692-4968

An 8-bit, gray-scale, flatbed scanner has been introduced by Hewlett-Packard Co.

The HP Scanjet Plus is available with either an IBM Personal Computer- or Apple Computer, Inc. Macintosh-compatible interface kit and provides 256 levels of gray, according to the vendor. An optional 20-page sheet feeder is available. The scanner costs \$2,190.

HP  
3000 Hanover St.  
Palo Alto, Calif. 94304  
800-752-0900

Pacific Data Products has announced a Hewlett-Packard Co.-Graphics Language (HP-GL) emulation cartridge for laser printers.

According to the company, the product offers a complete emulation of HP's 7475A plotter and implements HP-GL on an HP LaserJet Series II printer. The cartridge reportedly provides print-spooling capacity to 2M bytes and is priced at \$1,995.

Pacific Data  
6404 Nancy Ridge Road  
San Diego, Calif. 92121  
619-552-0880

### Board-level devices

A scanner and laser-printer controller has been introduced by Advanced Vision Research, Inc.

The Tiger-EMS board was designed for office publishing applications, the company said, and runs on Intel Corp. 80386-based machines as well as IBM Personal Computer, PC XT and AT and compatible systems.

The board comes with 2M bytes of random-access memory, expandable to 8M bytes, with a daughterboard option. The single-slot card includes memory-management software and supports several popular platforms.

The interface board, with 2M bytes of RAM and software, is priced at \$1,795. Advanced Vision Research  
2201 Quince Drive  
San Jose, Calif. 95131  
408-434-1115

Capital Equipment Corp. has introduced a multifunction board designed for use with IBM's Micro Channel architecture.

The OS/RAM8 provides up to 8M bytes of memory and two serial ports and automatically configures itself for DOS or OS/2, the vendor said. Micro Channel installation can reportedly be accomplished with four keystrokes, and no configuration changes are required when changing operating systems.

The board is priced at \$449 and includes a one-year warranty on parts and labor.

Capital Equipment  
No. 107, 99 S. Bedford St.  
Burlington, Mass. 01803  
617-273-1818

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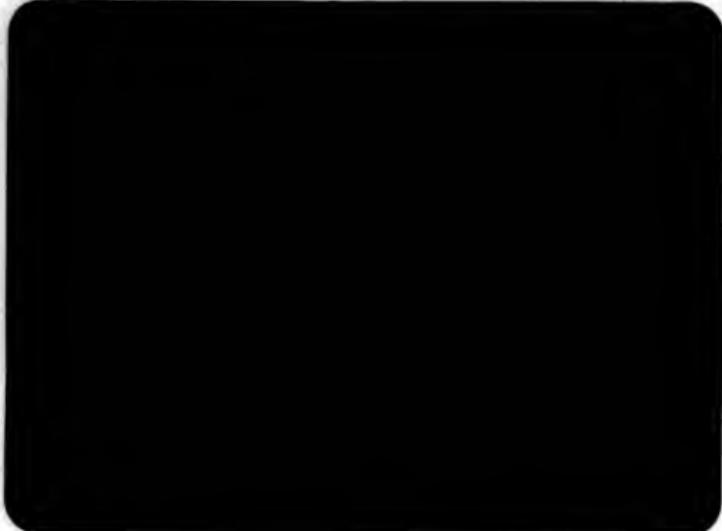
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# NETWORKING

## DATA STREAM

Thomas L. Nolle

## Life beyond AT&T



Second of a two-part series. In this column, Nolle introduced independent "switched" carriers that

are extending their geographic reach to challenge dominant interexchange carriers with lower prices and advanced service offerings. However, the reality of dealing with such companies introduces some potential snags.

Network management is one potential trouble area — particularly as regional carriers band together in consortiums. Once they have linked their respective networks, the problem of finger-pointing rears its head.

However, carrier management techniques are strong enough to allow most users to employ any major regional carrier without significant risk.

For example, National Telecommunications Network, a consortium of five regional carriers, maintains a separate network operations center from which it can oversee the high-level trunk activity in a multi-region network. If a problem is identified, the group's center

*Continued on page 57*

## Tariff 12 considered

AT&T's custom net service not for everyone

BY MITCH BETTS  
CW STAFF

WASHINGTON, D.C. — AT&T's Tariff 12 custom network service provides network managers with a host of new opportunities, but it can also leave them with new decisions to make about how much control they want over their carrier networks.

For example, Tariff 12 contracts put responsibility for network equipment, maintenance, repair and technology upgrades in the hands of AT&T, according to speakers at the corporation's Networks '89 conference earlier this month.

Berge Ayazian, vice-president of Boston-based research

and consulting firm The Yankee Group, said that means managers can reduce in-house staff and count on automatic upgrades, but it also means a loss of control when something breaks down.

### Trade-off

In addition, the volume discounts in Tariff 12 contracts discourage users from splitting their network traffic between two long-haul carriers. The trade-off for the carrier is the vulnerability of dependence on a single carrier, Ayazian said.

Tariff 12 is a regulatory umbrella that covers custom-network contracts negotiated with individual customers such as DuPont Co. and Ford Motor Co. The contracts provide a package

## AT&T signs corporate elite

Some of the largest U.S. companies are building custom AT&T networks under Tariff 12

Customer	Contract	Effective date
Defense Department	Defense Commercial Telecommunications Network	Oct. 1, 1985
General Electric	Digital Telecom Switched Network	Aug. 20, 1987
DuPont	VTNS Option I	Feb. 10, 1988
Ford	VTNS Option II	April 29, 1988
American Express	VTNS Option III	Oct. 31, 1988
American Airlines	VTNS Option IV	Jan. 30, 1989

\* Virtual Telecommunications Network Service

SOURCE: THE YANKEE GROUP  
CHART: COMPUTERWORLD

## E-mail services bow to X.400 pressure

BY ROBERT MORAN  
CW STAFF

As users increasingly demand connection links between different electronic mail systems, communications service companies are moving — however reluctantly — to support the CCITT X.400 standard.

Already widely supported in Europe, the X.400 protocol is finally catching on in the U.S.

Large corporations and the U.S. government want to link their private E-mail systems to a national E-mail network. Major customers have already provided X.400 support on the private side; now it's up to vendors such as Teletron Communications Corp. and Western Union Corp. to provide X.400 support on their public E-mail services.

Large customers want one

system that can connect them to members within their organizations but also to their suppliers and customers. According to Richard Miller, president of Rapport Communications, Inc., in Palo Alto, Calif., large business users are turning to X.400 because it can bear much more than the impersonal messages typically found on E-mail systems.

One of the business applications for X.400 is to work as a connection to electronic data interchange (EDI). The growing strength of business that use EDI to exchange documents electronically with business partners are increasingly de-

manding X.400 as a standardized E-mail system to deliver such documents. Standards bodies are already working on ways to integrate EDI with X.400.

In addition to the fudge from large corporations, two powerful bodies have used their might to bring the services companies closer to X.400. The Aerospace Industry Association (AIA) challenged vendors that tout X.400 last December to provide interconnection or lose their business. The association, Miller said, wants to subscribe to one vendor and communicate with the party of its choice, which may be using a different E-mail system.

*Continued on page 57*

## Studies help uncover ISDN markets

BY ELISABETH HORWITT  
CW STAFF

MORRISTOWN, N.J. — For the last two years, AT&T has conducted a series of Trivista studies to determine how ISDN and other enhanced services can meet the telecommunications needs of customers in various industry segments.

The 20 detailed studies conducted so far have generated integrated Services Digital Network customers for AT&T and the former Bell operating companies in almost every case, according to AT&T Network Systems Division spokesman Michael Vogel. The results, packaged into marketing pamphlets, have become part of AT&T's campaign to convince prospective users that "ISDN is here now." But they also offer clear map-

shots of how different types of organizations are gaining real cost and productivity benefits from the technology.

Trivista is a three-way partnership, consisting of AT&T's Network Systems subsidiary, "which knows the technology and products"; and telephone companies, "which provide the services"; and end users, "who know day-to-day business needs and can help us understand how to customize" the network to meet their Vogel said.

The team inventories the customer's networking installation and then conducts a study that "envisions what the introduction of ISDN would mean in terms of productivity and cost," Network Systems spokeswoman Ellen Bond said.

Market segments covered so far include insurance, health

care, manufacturing, banking, education, hotels and motels and government.

The first study subject — Temeclo, Inc. — has become a full ISDN user, with approximately 3,000 lines on Southwestern Bell Corp.'s ISDN Centrex service [CW, Jan. 30]. Among the other study subjects, which did not want their names disclosed, were the following:

• An insurance company developed the idea to install ISDN links to provide independent agents with the ability to access the latest product information over ordinary telephone lines. The application is designed to help the company gain a firmer hold on its better agents and make sure all agents are up-to-date and well trained, Vogel said.

A hospital concluded that ISDN would be useful for eliminating the expense of modems, incompatible local-area networks and private lines as a way to connect different departments in a city complex. The hospital is also considering implementing its own version of the insurance company application described above, which it learned about from AT&T. Doctors who use the hospital as a consulting hospital would be able to access the organization's data and applications via ISDN lines.

A hotel chain is looking at an application that would let customers check in at the airport but still have eye-to-eye contact with the hotel clerk through a compressed video signal sent over a 64K bit/sec. ISDN link.

Originally, Trivista aimed at finding applications for a variety of enhanced features and services that could be made available on the central office equipment that AT&T Network Systems sells, Vogel said.

"A lot of the enhanced service capabilities that ISDN brings will reside in the public network, in the central office. But there are also pre-ISDN enhanced services that provide customers with more control of the Centrex offering. It's rather difficult to get customers to upgrade a basic Centrex service to the tune of 20% to 50% [cost increase] unless you can truly see some value that's very direct," he said.

The initial idea was not to generate requests for proposals but simply to "document on an industry-by-industry basis what critical needs can be best or uniquely addressed by the services and to quantify those benefits to the end user and telephone company," Vogel said. The studies have "put into black-and-white what it costs a telco to implement ISDN for a specific user and how that might translate into a tariff," he said.

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—Joe Frizzell, Manager  
AT&T Data Maintenance Operation and Control Center  
Dallas, Texas

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service you couldn't buy from another vendor at any price. Because only AT&T offers it.

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## BIT BLAST

**Banks' role in EDI disputed**

Attendees at the recently held EDI and Financial Institutions Symposium debated the role banks should play in providing electronic data interchange (EDI) services. While many attendees said they are counting on the banks to provide these services, spokesmen from Procter & Gamble Co. and General Electric Co. stated that major corporations will deal directly with one another for most EDI transactions, turning to banks only for payment services.

In response to AT&T's recent 3.8% rate decrease, Vienna, Va.-based Cable & Wireless Communications, Inc., said it has also reduced rates for its long-distance and call accounting services and completed a major restructuring of its equal-access WATS service. Rates for interstate switched and dedicated access services have dropped an average of 5%. Fees for its call accounting and security features were reduced an average of 28%. The restructuring WATS service reportedly will provide 5% savings.

Data General Corp. has joined the OSI/Network Management Forum, a vendor organization dedicated to ensuring interoperability of different vendors' network management products through the use of Open Systems Interconnect protocols.

National Advanced Systems, Inc. (NAS) extended its scientific/engineering research recently by announcing an IBM-to-Digital Equipment Corp. VAX connectivity link. NAS, which often installs IBM-compatible machines at DEC sites, has agreed to co-market a high-speed network controller product made by Interlink Computer Sciences, Inc.

An electronic mail system for the hearing-impaired has been developed by Gallaudet College and Metrocast. It is said to send full-text messages either by Telecommunications Device for the Deaf or ordinary telephone to a portable pocket.

**Tariff 12**

CONTINUED FROM PAGE 51

rather than owning their entire network," he said.

"Tariff 12 provides the customer with the convenience of one-stop shopping, a single point of responsibility and an end-to-end solution," he continued. Moreover, Tariff 12 users tend to get new features such as bandwidth management systems before they are widely available, he said.

AT&T's goal, Arayanan said, is to create a close partnership with the top 200 national accounts and gain a competitive advantage in its head-to-head competition with MCI Communications Corp. and U.S. Sprint Communications Co.

Of course, MCI and U.S. Sprint are not sitting still. MCI recently signed contracts for custom-designed private networks with United Airlines, Procter & Gamble and Co. and Dup & Bradstreet Corp., while U.S. Sprint has new contracts with Westinghouse Electric Corp., North American Philips and the U.S. General Services Administration.

et-size receiver that vibrates to alert the recipient that a message is waiting.

Cayman National Bank and Trust Co., the only locally owned bank in worldwide financial center the Cayman Islands, has implemented a signature scanning, storage and display system using a hand scanner from Cameron GMBH in West Germany and a customized mouse-driven software program that runs on three NCR Corp. microcomputers compatible with the IBM Personal Computer XT. The personal computers use NCR's Towernet to access digitized signatures stored in an NCR Tower 600 hard disk.

IBM Information Network, which had served the U.S., Canada and Europe, will now provide E-mail and EDI services between the U.S. and Japan via IBM Systems Network Architecture links.

Four companies have successfully completed protocol verification procedures to integrate their applications with Integrated Business Exchange, a private branch exchange system from Wang Laboratories, Inc. subsidiary Intecom, Inc. The vendors are Amscom Software, Inc., Compeco, Inc., Digital Techniques, Inc. and StarNet Corp.

As part of a recently launched campaign to modernize and improve its telecommunications network, China is installing AT&T SESS digital switches in many of its major cities. One of the SESS machines, handling 12,160 lines, was installed to handle data and voice communications for the Ministry of Railways in Beijing.

**The Canadian Imperial Bank of Commerce** in Toronto will become the first commercial user of Bytek Systems' Unity system, which is said to provide local and wide-area switching and network management capabilities. The \$1 million-plus contract calls for two Unity 50 systems to be installed in two of the bank's data centers, Bytek said.

**Simpact Associates, Inc.** and **Systems Strategies, Inc.** (SSI) have announced a marketing and distribution agreement to develop and market a turnkey DEC-to-IBM system that combines SSI's VAX Link/SNA software family with Simpact's hardware platform. The product reportedly will support 3270,

RJE and, eventually, LU6.2-based links between DEC and IBM hosts.

**Contel ASC** has boosted its capacity to provide very small-aperture terminal satellite services by installing a fourth shared hub at the New York Teleport in Staten Island, N.Y.

fic makes up 90% of the network volume and thus generates most of the price discounts.

• The contracts lock customers into AT&T's service for three to five years, "but you're going to have some heavy liability if you try to get out of that too quickly."

Customers also should be aware of the regulatory uncertainty surrounding the controversial Tariff 12, which the Federal Communications Commission allowed to take effect pending an investigation. It is not clear what will happen to existing networks if the FCC, or a court, rules Tariff 12 unlawful.

The FCC is currently investigating charges by MCI, U.S. Sprint and others that Tariff 12 is illegal because the custom networks do not qualify as generally available common-carrier services and the special discounts could amount to predatory pricing.

John R. Hoffman, senior vice-president at U.S. Sprint, said he is concerned that "as more time passes, it is going to become more difficult to unscramble the egg if Tariff 12 is ultimately found to be unlawful."

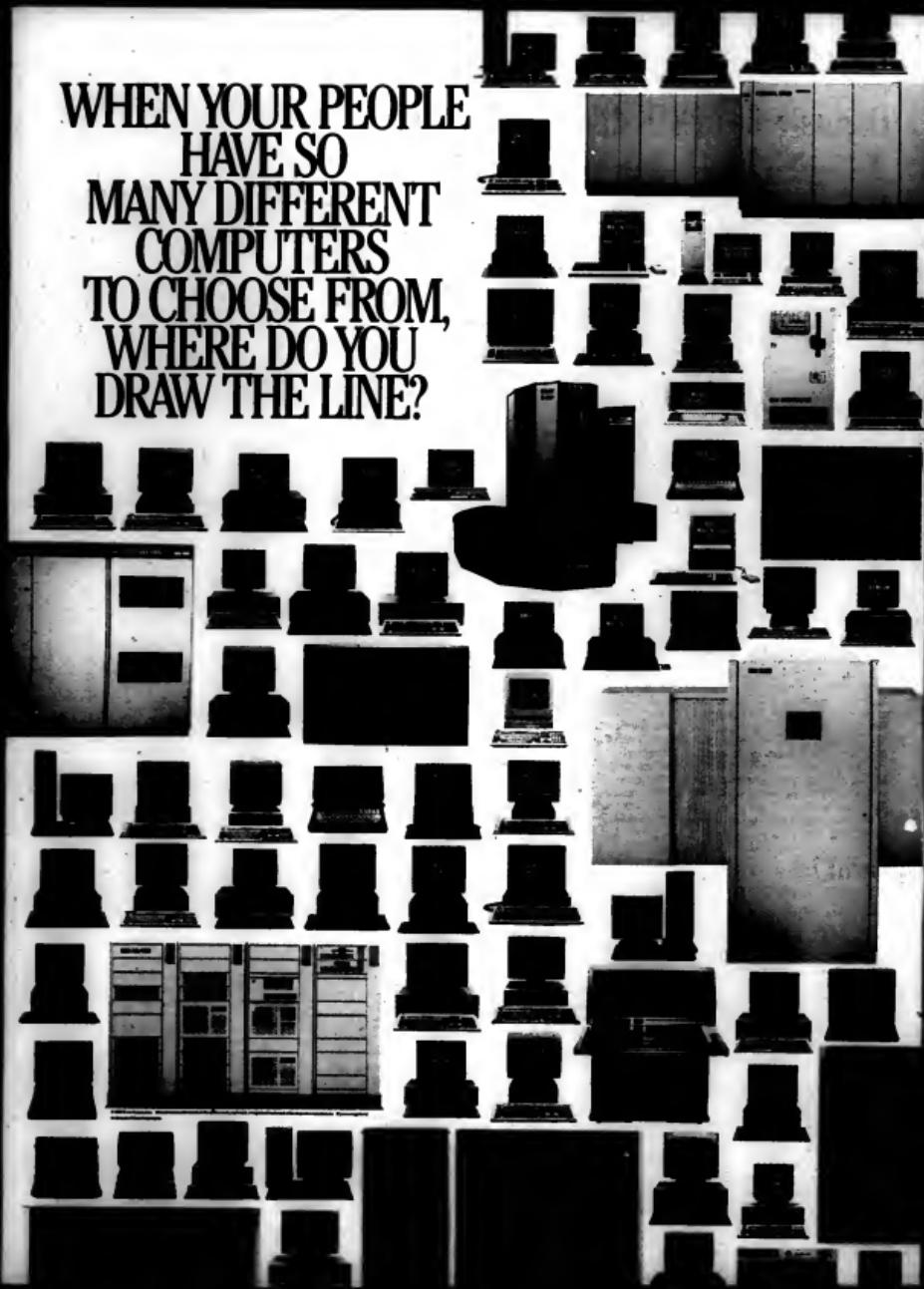
Bob,

**Legal questions**

- Is Tariff 12 illegal if customers are not allowed to terminate their services?
- Can the discounts be too low, and are the discounts imposed by other carriers discriminatory?
- Is Tariff 12 illegal if customers are not allowed to terminate their services?
- Can the discounts be too low, and are the discounts imposed by other carriers discriminatory?
- Is Tariff 12 illegal if customers are not allowed to terminate their services?
- Are AT&T's Tariff 12 services excessively bundled?

MITCHELL TIE

WHEN YOUR PEOPLE  
HAVE SO  
MANY DIFFERENT  
COMPUTERS  
TO CHOOSE FROM,  
WHERE DO YOU  
DRAW THE LINE?



## Nolle

CONTINUED FROM PAGE 51

hands it off to a regional center, whose own network management system can usually test circuits through the local exchange right to the customer's interface.

This is not always the case, however. Most of the regional carriers have purchased fiber right-of-way and tend to locate their switching and connection points — points of presence, or POPs — along their routes. Thus, while an Amarillo, Texas, data center manager may be able to lease digital service from a regional carrier easily, someone in Pierre, S.D., may have no regional carrier at all.

Even where there is a POP in the area, the user may find that the distance between the regional POP and the target termination for the service is so great that local access charges exceed the long-haul cost.

Like all telephone circuits, a regional-based circuit has several cost components. The interexchange charge set by the regional carrier moves the information between the POPs closest to the subscriber's endpoint. Local exchange costs are assessed to link that endpoint to the nearest POP. Both these costs typically include a one-time installation charge and a monthly recurring charge. Carriers may also bill for service coordination if they want the regional carrier can set up the local access line for them.

It is important to understand the charge basis when dealing with a regional carrier, but it is also important to understand the difference between these carriers and some of the larger and more regulated interexchange carriers.

AT&T, MCI and Sprint all have pub-

lished tariffs for interexchange service. Other carriers such as ITT also file government tariffs, available from the Federal Communications Commission and the carrier, that provide not only service rates and other charges but will also indicate discount schedules and terms. Regional carriers are rarely required to file their rate schedules and thus rarely have them available for review.

Getting a copy of an interexchange carrier tariff helps set a baseline against which regional rates can be measured. Pricing varies widely with the duration of the contract and the total dollar volume of business or circuit miles involved. A cross-country T1 route may be priced at more than \$40,000 per month on a month-to-month basis from one carrier and at \$24,000 per month on a one-year term from another.

Quality is always a concern of network users and particularly so when "name-brand" carriers are not used. Most regional carriers will guarantee error performance at levels similar to and sometimes better than the large interexchange carriers. Many have all-fiber networks or are exclusively fiber on most major city-pair connections, so they are not fearful about writing quality commitments and service credit terms into an agreement.

For users lucky enough to be located near a regional carrier's POP, the service and cost benefits may be very significant. Major firms have reported savings of 40% over the best terms negotiable from the major carriers. In these times of financial pressure, a regional carrier can often mend a broken budget.

Note is president of CIMI Corp., a communications consulting company based in Hightstown, N.J.

## E-mail services

CONTINUED FROM PAGE 51

service vendor.

Adding more force is the Government Open Systems Interconnect Profile, or GOSIP, a federal information processing standard established last August that mandates that governmental agencies purchase their communications services according to the International Standards Organization's Open Systems Interconnect, which includes X.400 messaging.

Until now, most analysts contend, service vendors have responded to customer demand for X.400 by providing X.400 gateways to computer-based E-mail systems and promising to connect to competitors later.

"The service vendors have been playing a waiting game as far as providing X.400," Miller added.

But this appears to be changing. Telnet, AT&T, MCI Communications Corp., Discos, Inc., GE Information Services, GTE Communication Systems, McDonnell Douglas Corp., and Western Union Corp. made commitments to participate in the AIA pilot project. IBM Information Network, which is preparing to offer an interconnection, has yet to commit to the pilot. Western Union has committed to an X.400 interconnection with GE Quicktron and McDonnell Douglas Optronics, but the company does not offer X.400 services.

According to Marci Erlich, district manager of electronic messaging systems

and office automation at AT&T, the company is testing an X.400 connection between AT&T Mail and an undisclosed service in addition to its connection with Discos, announced in January. Western Union, according to Vice-President of Marketing Brian Gaylord, has been testing X.400 with a few U.S. customers and European administrations. Telnet also has set up international X.400 connections, a company spokeswoman said.

### Sign of life?

One sign of the healthy demand for X.400 is the fact that many vendors are working on the next generation of X.400 gateways, at least partly because the current products cannot efficiently handle growing traffic demands, Miller said.

However, both national and international X.400 networks are still missing one critical element for success: directory. From electronic analogs to the telephone company's white pages, directory services would allow users on different vendors' E-mail services to exchange mail automatically — without first having to call a recipient to find out his or her mailbox address, log-on name and so on.

But directories currently do not offer the necessary universal accessibility, which will be provided by the latest version of the X.500 directory standard. Now that X.400 gateways are in place, vendors are expected to move more quickly from the 1984 version of X.500 to the 1988 version.

According to Miller, the vendors plan to offer X.500 directories in conjunction

with their next X.400 offerings. Telnet said it plans to announce an X.500 directory in the fourth quarter.

Another thorny issue that has bogged down X.400 service introductions is allocation of charges when two or more E-mail services are involved in a user exchange. Service vendors have been meeting with European communications carriers and value-added network suppliers in the International ADMD operators group to establish what must be measured and what is chargeable.

According to Miller, service providers already interconnected have brought their experience and influence to play at the committees. Walter Ulrich, a partner at Cooper & Lybrand's Management Consulting Services Division, added that corporations are already conditioned to paying premiums for telecommunications links that involve more than one carrier and will likely look to telephone charges as a model.

## X.400 group coalesces

**A** group of computer and communications vendors has formally launched the X.400 Application Program Interface (API) with the goal of developing application program interfaces for the CCITT X.400 messaging standard.

Interfaces are designed to allow personal computer applications on networks to access X.400 services. "Our goal is to encourage the integration of LAN applications with wide-area services," said Steven Linn, director of PC Services at Telnet Communications Corp. "With X.400, we hope to provide access to services on a point-to-point level, access to each other, regardless of their operation platform."

The group, which seeks to ensure interoperability among different vendors' implementations of X.400-based products, actually kicked off last year with a series of informal and organizational meetings.

X.400 is the first global E-mail standard that provides true OSI interoperability between systems and software from a variety of vendors, according to the APIA.

The standard is supported worldwide by vendors and users, many of whom consider the standard key to non-electronic data exchange-related external communications with business partners and far-flung internal sites.

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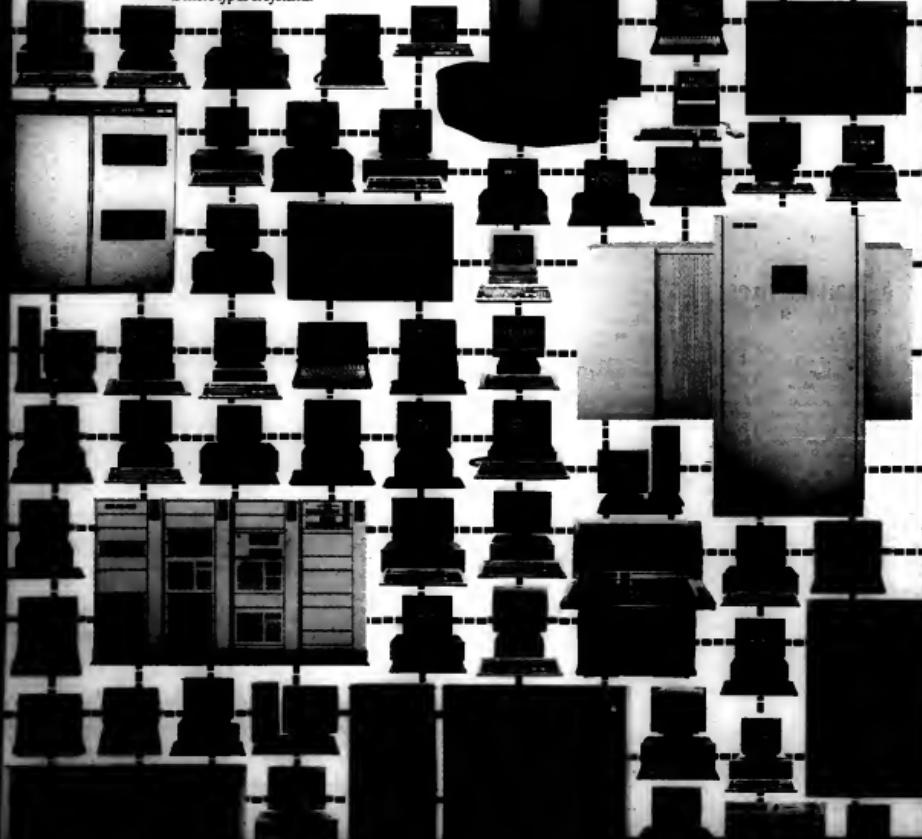
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## NEW PRODUCTS

**Local-area networking hardware**

Cisco Systems, Inc. has introduced a four-member family of internetwork routers and terminal servers designed to provide connections to Token-Ring (IEEE 802.5) local-area networks.

The product line reportedly includes a Token-Ring terminal server that supports up to 96 devices, a Token-Ring-to-Ethernet (IEEE 802.3) router, a Token-Ring-to-Token-Ring router and a Token-Ring-to-wide-area network router that uses synchronous serial lines.

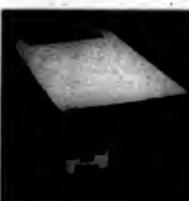
The four products are based on the company's Token-Ring Interface card, which provides a connection to Token-Ring networks running at speeds up to 4Mbit/sec.

Pricing ranges from \$11,900 to \$20,800, depending on configuration. Upgrade kits are available for current units.

Cisco Systems  
1350 Willow Road  
Menlo Park, Calif. 94025  
415-326-1941

Digital Products, Inc. has introduced an unattended tape backup facility for use with the company's Netcommander sub-local-area network series.

Called Subban Backup, the unit is designed to automatically protect data on departmental personal computer hard disks, including the hard disks of individual



Digital Products' Subban Backup

sub personal computers connected to local-area networks.

The product is available as a Subban option and ranges in price from \$3,495 to \$3,995.

Digital Products  
106 Water St.  
Watertown, Mass. 02172  
800-243-3333

Jupiter Technology, Inc. has introduced the System 100, a line of data communications computers the company said is intended for use at remote sites of large networks.

The systems can be used as a local-area network server or a multiserver terminal cluster controller, and all of the systems use a proprietary communications operating system, the vendor said.

The System 100 is capable of serving from four to 384 lines and is priced from \$8,500.

Jupiter Technology  
78 4th Ave.  
Waltham, Mass. 02154  
617-890-1555

**Network management**

Micom Communications Corp. has announced X.25 Network Management System (XNMS).

The product is based on an IBM Personal Computer AT/Intel Corp. 80386 platform and is said to provide a graphics monitor, centralized configuration, event management and call accounting capabilities. The Xenix-based XNMS software program reportedly allows multitask processing on the AT, and file conversion is included for importing billing and statistics files to Lotus Development Corp.'s 1-2-3 spreadsheet.

The XNMS package, including software, the Xenix operating system and an Econ Technology Corp. X.25 Communications Card and software, is priced at \$15,000, with deliveries scheduled to begin this month. The 386 PC AT is purchased separately.

Micom  
4100 Los Angeles Ave.  
Sierra Valley, Calif. 93063  
805-583-8600

BBN Communications Corp. has announced the migration of its Network Access System (NAS) from Digital Equipment Corp.'s Microvax II to a Microvax 2000 platform.

NAS was designed to protect sensitive information and system resources on BBN wide-area networks from unauthorized access. The system is composed of a centralized Master Database host and one or more distributed Access Control Server hosts, the vendor said.

Pricing starts at \$125,000 for a minimum configuration, which includes two Microvax 2000 computer systems.

BBN  
150 Cambridge Park Drive  
Cambridge, Mass. 02140  
617-873-2683

Hewlett-Packard Co. has announced the release of several enhancements to the HP 4954A wide-area network protocol analyzer.

The product has been upgraded to include the following: the HP 4954A access and analysis software for Integrated Services Digital Network, priced at \$20,500; the HP 18320A language processor for C programming, priced at \$2,000; and the 49521A package for emulating X.25 Levels 2 and 3, also priced at \$2,000.

Hewlett-Packard  
3000 Hanover St.  
Palo Alto, Calif. 94304  
800-752-0900

Emerald Systems Corp. has introduced a local-area network data management system for use with Novell, Inc.'s Advanced Netware.

Called EMQ, the system provides shared tape backup services and allows network supervisors to manage offline data storage systems.

Emerald Systems' Tape Backup Server system, which includes both EMQ and the VST Device, is priced at \$8,490, the company said.

Emerald  
4757 Morena Blvd.  
San Diego, Calif. 92117  
619-270-1994

## And in the rest of the company

**Links**

Canon U.S.A. has expanded its family of personal facsimiles with the introduction of the Faxphone 15.

The desktop communications device reportedly incorporates both facsimile and telephone features into a single compact, lightweight design. According to the company, the unit transfers information at 9.6K bit/sec. and includes an automatic five-page document feeder, fax mode,



automatic background control and automatic reception capabilities.

The Faxphone 15 costs \$1,695.

Canon  
One Canon Plaza  
Lake Success, N.Y. 11042  
516-488-6700

A remote communications processor that accesses incompatible databases simultaneously has been announced by Commemetics, Inc.

The stand-alone Commemetics CN-2000 reportedly features Commem Application Mapping software that lets terminal users enter one request, which is automatically reformatted to access incompatible databases residing on up to six host mainframes.

The unit utilizes a Motorola, Inc. 68000 processor and operates under Unix, the company said.

The CN-2000 is priced from \$150,000 for a 48-user system.

Commematics  
390 University Ave.  
Westwood, Mass. 02090  
617-326-1221

A software product that transfers data and integrates operations among Tandem Computers, Inc. computers and IBM mainframes has been announced by The Systems Center, Inc.

Network Driver-Tandem (NDT-Tandem) enables Tandem computers running the Guardian operating system to communicate with mainframes running NDM-MVS, NDM-VM and other NDM products.

The package has file transfer, automated operation, management control and security functions, according to the company.

Pricing ranges from \$2,000 to \$30,000, depending on processor size.

The Systems Center  
Suite 101  
2477 Gateway Drive  
Irving, Texas 75063  
800-292-0104

An optically isolated RS-232 to RS-422 port in adapter has been introduced by Computer Dynamics, Inc.

According to the vendor, Opto-Adapt can connect RS-232 and RS-422 interface circuits bidirectionally at distances longer than 5,000 ft. The adapter can be used for long-haul communications between buildings and has a price tag of \$120.

The external power supply, which is not included, is available for \$10.

**Computer Dynamics**  
107 S. Main St.  
Greer, S.C. 29651  
803-477-8700

A PC-to-PC telecommunications program for file transfer applications has been announced by Edokon Technologies.

Called Quicktrn II, the product reportedly uses an increasing line of decompression technology for file transmission and can be used to set up an unattended electronic mailbox. An IBM Personal Computer, Personal System/2 or compatible system with a Hayes Microcomputer Products, Inc.-compatible modem is required.

Quicktrn II costs \$39.95. An

individual copy is needed for each end of a file transfer.

**Eidecom**  
P.O. Box 20680  
Columbus Circle Station  
New York, N.Y. 10023  
212-795-7909

Dresselhaus Computer Products has announced that it is shipping its latest version of Smartprint, a laser sharing system for IBM,

Apple Computer, Inc., Digital Equipment Corp. and other computers.

Smartprint/LSS is reportedly capable of connecting multiple processors to any laser printer. It is available in either four- or six-port versions, which are priced at \$179 and \$199, respectively.

Both versions of the product are offered in parallel or serial configurations.

**Dresselhaus**  
Suite 405  
8560 Vineyard Ave.  
Rancho Cucamonga, Calif.  
91730  
800-368-7737



**Dresselhaus' Smartprint**

Cablenet Systems, Inc. has added two low-cost bridges to its family of Ethernet products and services.

The NB20E and NB25E series of two-port intelligent bridges were designed to provide high-performance connectivity between Ethernet and 802.3 local-area networks of various media, the vendor said. The products reportedly allow users to connect two or more Ethernet segments to create extended-distance LANs and increase efficiency.

The bridges operate at the data link level of the Open Systems Interconnect model and are protocol-independent. The NB20E costs \$2,995, and the NB25E is priced at \$5,495.

**Cablenet**  
10 Main St.  
Rochester, N.H. 03867  
603-332-9400

GSI-Danet, Inc. has announced a family of Unix-based Open Systems Interconnect (OSI) development products designed specifically for software development personnel.

The OSI Product Development Support System reportedly will guide designers through the development process, analyze the behavior of OSI software and test for OSI conformance before modules are integrated into the final product.

The products can be used with a variety of hardware systems and are priced from \$32,000.

**GSI-Danet**  
Suite 300  
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Reston, Va. 22091  
703-758-0077

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**INTERFACE '89**

A line-sharing device aimed at the computer, facsimile and telephone markets is now available from Lynx Automation, Inc.

Called Extraline, the product was reportedly designed to make one telephone line perform the work of two. It includes a microprocessor that automatically directs calls to a choice of devices and can operate in unattended mode, the vendor said.

Extraline costs \$299.

Lynx  
P.O. Box 99068  
Seattle, Wash. 98199  
206-285-1754

### Protocol converters

A protocol converter that connects the IBM 3262 printer with IBM's Application System/400 midrange computer has been announced by Black Box Corp.

The PQ-3262 is designed to allow the printer to attach directly to the host's twin-axial cable and will not degrade printer speed or other features, accord-

ing to the vendor.

The converter also facilitates connection between the 3262 and IBM System/36 Models 5360, 5362 and 5364. It is priced at \$2,990.

Black Box  
Box 12800  
Mayview Road at Park Drive  
Pittsburgh, Pa. 15241  
412-746-5500

Codex Corp. has introduced two CCITT V.32 modems, the 2264 and the 2266.

The 2264 is available in a

stand-alone or nestable rack-mount version and supports operating speeds from 1,200 to 9.6K bit/sec. in asynchronous or synchronous modes over two-wire dial or two-wire or four-wire leased lines, according to the company. It is priced at \$1,695.

The 2266 is the international version of the 2264 and is priced at \$1,900.

Codex  
Marefield Farm  
7 Blue Hill River Road  
Canton, Mass. 02021  
617-364-2000

E-Tech Research, Inc. has introduced a CCITT V.32-compatible, 9.6K bit/sec., full-duplex modem.

The E9696 is said to be capable of communicating with mo-

dem ranging from 9.6K bit/sec. to 75K bit/sec. on either full-duplex or half-duplex modes and synchronous or asynchronous modes over dial-up or leased lines. It is priced at \$1,695 with a two-year warranty.

E-Tech  
No. 275  
2700 Augustine Drive  
Santa Clara, Calif. 95054  
408-962-0270

# Why didn't we go with HP in the first place?



Black Box's PQ-3262

ing to the vendor.

The converter also facilitates connection between the 3262 and IBM System/36 Models 5360, 5362 and 5364. It is priced at \$2,990.

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### Modems/ Multiplexers

Codex/Datatel, Inc. has introduced three Bell-compatible modems.

The Rixon 4212 dual-speed, full-duplex modem for direct-distance-dialing switched networks reportedly operates at speeds up to 1,200 bit/sec. The Rixon 4202 asynchronous modem operates at speeds up to 1,800 bit/sec. Both devices are priced from \$469 to \$489.

The Rixon 4200 829 frequency converter was developed for standard modems in four-wire leased or unloaded private line, 3002-type voice-grade data channels. It is priced from \$299

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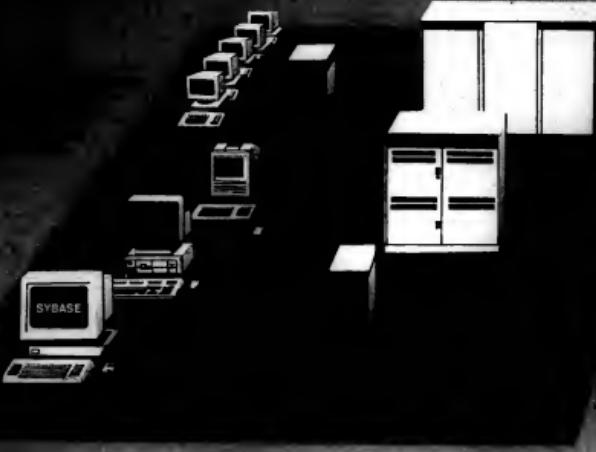
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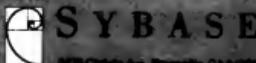
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# PRODUCT SPOTLIGHT

## RELATIONAL DBMS

RDBMS show they can pull OLTP weight

BY ALAN RADDING

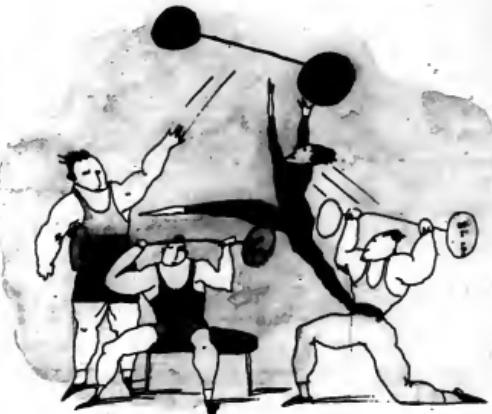
**F**or years, relational database management systems have been regarded with suspicion in terms of their ability to handle on-line transaction processing (OLTP) applications. Recently, however, improvements in relational DBMS products and some changes in thinking about what cost-effective transaction processing is really all about have combined to produce more application opportunities for RDBMSs at this level.

For example, at Capital Market Technology, Inc. (CMT), a Berkeley, Calif.-based foreign currency trading firm, a Sybase, Inc. RDBMS running on a Sun Microsystems, Inc. workstation is used for 24-hour on-line updating of currency prices. According to Brian Chapman, computer operations manager, the system supports about 20 concurrent users and a transaction volume that averages around 15,000 per day. CMT shuffles its clients' money from one currency to another to take advantage of minute-by-minute market fluctuations, Chapman says, and the Sybase RDBMS is a critical cog in that process.

Currency trading represents a specialized niche within the financial services industry, and CMT is typical of the users who are taking a chance on the combination of relational technology and OLTP.

On-line transaction processing is a broad concept but is generally understood to involve the management of critical production applications in a real-time environment. Conventional OLTP applications involve very high volumes of generally simple, straightforward tasks, such as debit/credit transactions.

The classic OLTP systems — airline reservations and bank



BLAINE THOMAS

automated teller networks — predicate relational technology. "Nobody would dream of trying to rewrite one of these major legacy programs," observes Kenneth Bonevorth, president of the market research firm International Resources Development, Inc., in New Canaan, Conn.

The real growth potential for RDBMS in OLTP, Bonevorth says, is in applications written for smaller niches within the traditional heavy-OLTP industries or in areas, such as factory automation, that lie outside the usual domain of OLTP.

OLTP in the factory is not very different from OLTP in an environment like banking, says Eric F. Palmer, president of The Palmer Group in Atlanta. True, the input comes from a factory floor device reporting an operation instead of from a teller taking a deposit, but the require-

ments on the system are virtually identical, he maintains. "OLTP in integrated manufacturing just means you are getting a stream of input from a lot of devices instead of people," Palmer points out.

Palmer, a database specialist, recently served as systems integrator on a state-of-the-art factory automation project for a Northeast defense systems contractor that incorporated Relational Technology, Inc.'s Ingres RDBMS.

According to Palmer, Ingres 5.0 is performing just fine on the project, even though the factory runs as many as 140 concurrent users and handles up to one million multistatement transactions each day. Response time is generally calculated in microseconds, he says, although a few transactions may take as long as 10 seconds. "We modeled the frequency of transactions and optimized

for the ones that run thousands of times rather than the handful that run just a couple of times," Palmer adds.

One of the things that is happening, suggests George Schusel, president of Digital Manufacturing, Inc., in Andover, Mass., is that although most RDBMSs still cannot compete with hierarchical products on the basis of pure speed, many organizations are coming to feel that speed of throughput is not the only consideration and transactions per second is not the only yardstick when it comes to transaction processing.

"Most businesses don't care about transactions per second," Schusel maintains. "What really is important is transactions per dollar, and this is where an RDBMS can really beat a hierarchical system. The RDBMS may not be faster, but it will be cheaper."

The savings, Schusel and others say, come from flexibility that the relational model provides. A relational database is a database in which the logical data is organized simply as tables without the pointers or structural elements of a hierarchical database and independent of the physical data. Using keys and indexes, an RDBMS automatically navigates through the database

### INSIDE

#### Fantasy or Fact?

Myths and realities about relational technology. Page 76.

#### Crowding in the Corner

Database managers fight to defend traditional turf. Page 77.

#### Smooth Move

Transition to an RDBMS requires careful planning. Page 79.

Radding is a Boston-based free-lance writer.

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## OLTP

FROM PAGE 63

with the assistance of an optimizer.

The separation of the logical data from the physical structure of the database allows you to create the database without first having to rigidly define how the data is to be used. Tables can be added to or deleted from the database or columns and rows can be added to or deleted from existing tables without affecting the data already there and the application already on the system.

The result is that a relational database is faster and less costly to develop and maintain compared with traditional database schemes. "Maintenance costs for hierarchical systems are so high that you can spend a lot on hardware with a relational DBMS and still save money by comparison," says David Ellis, president of the Data Administration Management Association (DAMA) in Seattle. Hardware performance keeps coming down in price, Ellis notes, but the cost for programmers does not.

Brian Martin, senior software engineer at the Denver-based Astronautics Group of Martin Marietta Corp., says he appreciates

that distinction.

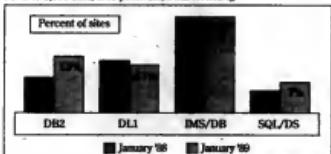
"There's a guy down the hall running a database on IMS, and making changes is so hard that they do it only twice a year. We modify ours on-line every day," Martin says.

Martin has no illusions about the reality behind many of the

scribes the Astronautics Group's application, but that is definitely the way that Martin, whose group maintains the human resource database for five Martin Marietta companies in Colorado, sees it. "This isn't your typical OLTP application, like retail or a bank, but we do a lot of concu-

## New blood

*While IBM's relational DBMS products continue to make inroads into Fortune 1,000 sites, IMS penetration has leveled off*



SOURCE: COMPUTER INTELLIGENCE CO. CLIMATE DESIGNER/IMAGE

complaints about relational DBMSs in an OLTP environment. He has seen most of them in action. But, having stuck with Oracle Corp.'s Oracle since Version 2, he can also testify to the dramatic improvement that has taken place in that product since 1983.

Some might quibble with the use of the label OLTP to de-

termine what is done in the environment every day," he says.

In fact, the Martin Marietta human resource system is made up of eight databases, each containing 15 to 150 tables. The entire database requires 750M bytes of memory. The largest table is 750,000 records. Because employees are moved frequently as job locations and assignments

# "DYL-280 II's DB2 Interface enables us to do mixed mode processing and report generation in one easy step."



**“**DYL-280 II's DB2 Interface enables us to do mixed mode processing and report generation in one easy step. QMF is fine for straight report writing, but we want to be able to read and update a DB2 table using a flat file, and then produce a report simultaneously. This can't be done with QMF, and the other alternative is to use Cobol. DYL is far simpler to use and much faster. Another feature we like is the way DYL handles the return code.

We're using the DB2 interface more and more, both as a programmer's tool and as an end user's tool. Everyone is very pleased with the way the product has performed for us.

**“**

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change, changes to the databases are common. Like any OLTP transaction, Martin Marietta is concerned with throughput, referential integrity, security, monitoring — all the issues that concern a traditional OLTP operation.

The company had no choice but to turn to an RDBMS when it wanted to put its large and extremely complex personnel management system on-line in 1983. Martin says, "We have a matrix management system. That means you have two bosses. You can't handle that with a hierarchical system. You would need two chains."

For that reason, Martin determined that there was no choice but a relational system. Unfortunately, making that decision at that time meant facing the worst problems associated with RDBMSs in an OLTP setting.

#### Out of the doghouse

"At the beginning, Version 2 was a dog," Martin recalls. "It crashed weekly, sometimes several times." By Version 3, the biggest problems were corrected. With Version 4, productivity began to improve; Version 5 further improved productivity. Version 6, he believes, finally delivers industrial-strength RDBMS.

The system now handles as many as 60 concurrent users running Oracle Version 5 on a Digital Equipment Corp. Vaxcluster. The group is testing Version 6, which Martin expects to put on the Vaxcluster as soon as a couple of problems are resolved.

The Martin Marietta experience highlights both the promise and frustration of RDBMSs for OLTP. Undeniably, performance has been a frustrating problem, especially when compared with hierarchical and networked systems, but the RDBMS products have improved steadily.

Not all of the problems with relational DBMSs as a foundation for OLTP have been completely resolved. Questions about speed, throughput, referential integrity, security, recovery, concurrency and fault tolerance still crop up, but there has been considerable progress.

Advocates for the relational approach insist that there are no inherent problems, either in speed or functionality, with the relational model as it applies to RDBMSs in OLTP. The problems, as they see it, are the result of poor initial implementations of the relational model by the vendors and deficiencies in the other components of the RDBMS offerings such as inefficient exploitation of the hardware platform.

Vendors are responding by boosting the performance of their systems at both hardware and software levels.

According to Colin White, publisher of "Info DB," a journal based in San Jose, Calif., three key areas affect the performance of an RDBMS in OLTP: implementation of the relational model itself, the system architecture and the tools. Most of the performance problems in systems that properly implement the relational model, he says, result from a failure to exploit the architecture properly.

Among the software improvements being undertaken are better optimizers, precompiled transactions, I/O pipelining, memory buffering, better disk management, improved data dictionaries, multiple degrees of row-level locking and better tool sets.

The newer systems also are likely to allow users to back up and dump data on-line to allow continuous opera-

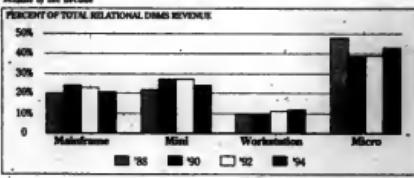
tion. The addition of journaling and mirroring provide recovery capability, allowing the system to return to the last completed transaction automatically after a sudden failure.

A growing number of popular RDBMSs, such as Oracle and Sybase, are available as fault-tolerant systems from vendors such as Tandem Computers, Inc. and Sun Microsystems, Inc., to provide truly continuous operation.

On the hardware level, the systems are beginning to take full advantage of multiprocessors, multithreading, distributed computing, caching, increased memory and increased storage. "You want your RDBMS to exploit your processor. Throwing MIPS or hardware at the problem only helps if your RDBMS can really

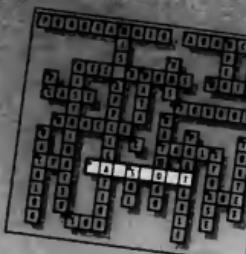
#### Ebb and flow: Relational DBMSs 1988-1994

The mainframe and mini relational markets should peak in the early 1990s, then fall off slightly; micro relational products should dip in the same period, then pick up toward the middle of the decade



SOURCE: MARKET INTELLIGENCE RESEARCH CO. CW/CHART: DODD/INTL

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## OLTP

CONTINUED FROM PAGE 65

take advantage of it," White says.

The real key to the performance of an RDBMS is the optimizer, according to Jeffrey Task, president of Database Decisions, Inc., a Newton, Mass., consulting firm. The optimizer performs the automatic navigation of the database, he says, after translating the high-level SQL command into a low-level navigational strategy.

The use of an inverted component to reduce I/O and the extensive use of indexes allows the optimizer to boost performance, Task explains. Furthermore, if enough memory is available, indexes can

be put into memory so that the relational DBMS navigates at memory speed.

The experience of Questar Services, the data processing division of Mountain Fuel Supply Co., a natural gas utility in Utah, illustrates the critical importance of indexing in the optimizer. Questar has been testing DB2 in an effort to determine whether to switch its 20-year-old customer service OLTP system to the RDBMS because of a growing need for flexibility.

Although the Questar system, with 400 concurrent users, does not run particularly high-volume or complex transactions, performance, as seen in response time, is critical. "This system is a major part of the company. This is where we get our revenue," says Jerry Edwards, sys-

tems analyst at Questar's information systems engineering department.

In a test of the system, Questar loaded a table with 300,000 records, with and without an index, and then tried to bring up 15 accounts. Without an index, it took 23 seconds. With the index, it took one second. "Indexing is the key," Edwards concludes.

To assist the optimizer, most of the new RDBMSs offer some kind of precompiled transaction. Essentially, the pre-compiled instructions allow the system to store the navigation for frequently run transactions so that the system does not have to refigure the navigation each time the operation is called up.

"Sybase give us something they call 'triggers,' which are stored procedures,"

## Mixed breeds

**S**ome vendors have tried to bridge the gap between relational DBMSs and conventional systems for OLTP by developing hybrid systems consisting of a relational-style front end attached to a hierarchical database.

This approach appeals to some users because they say it gives them the elements they most like about relational technology while allowing them to stay with an underlying structure they already know can do the job.

The Software AG Adabas system in use at the University of Texas at Austin, for example, provides some relational-like capabilities but retains an inverted file structure. That is all the relational flavor an OLTP environment needs, according to Randy Ebeling, assistant to the director of data processing. "It is the language, not the structure, that needs to be relational," he says.

Many would argue that point, but Ebeling, who ran benchmark tests on a mix of relational and non-relational products from five vendors, is convinced. The university needed to manage five production databases averaging about four million transactions per week, he says, and trying to handle that kind of load with a purely relational DBMS would have required too much hardware.

The reasoning behind the adoption of a hybrid system at the U.S. Customs Office is slightly different. When it decided that a change was needed in the DBMS used to track all shipments and individuals crossing U.S. borders, the Washington, D.C.-based agency simply wanted to combine what it already had — a 7-year-old Datacom inverted list database with a front end incorporating relational-style features.

The reasoning led it to CA-Datamax/DB, a newer product from Computer Applications International, Inc., which is based on Datacom but integrates an SQL-like front end and a number of relational features including set processing and set selection.

This system was presented as "a production implementation of the relational database," not as a purely relational product, says Clyde McPherson, a CA senior software support manager.

That task seemed like "the best of both worlds" to Glen Samples, chief of the database branch of U.S. Customs. The Customs Office operation is large, he says, and it is doubtful that a purely relational system would be robust enough to support 8,000 concurrent users generating an average of 1,300 requests per second.

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OLTP's demands," he says.

Most of these improvements have nothing to do with the relational model — they come from better use of the overall system architecture or by providing a better set of software tools.

Kastner, however, is not all that concerned about relational purity and does not think that users who are interested in RDBMSs for on-line transaction

processing should let the issue worry or deter them, either. "Users have to be concerned with developing systems that make money for the business," Kastner says. In some cases, gaining RDBMS/OLTP performance may entail giving up some of the flexibility of the relational model, he says, but benchmarking indicates that is what is necessary, users should not let

that stop them.

Evidence suggests that fewer users are letting anything deter them. For instance, when a travel reservation system was being built in the Southwest recently, there was no question that the OLTP system would be relational. "We liked the [relational] application. We didn't even discuss whether it was relational or not," says the system's technical

support manager. The reservation system uses a Sequent Computer Systems, Inc. computer with a Unix-based RDBMS to handle 60 concurrent users with a subsecond response.

Bill Werbin, vice-president of wholesale information systems development at Manufacturers Hanover Trust Co. in New York, is so confident in the growing power of the RDBMS products

in OLTP that he is planning a new DB2 system with high transaction rates for 1990.

The bank has used relational transaction processing products before, but only for low-volume applications, Werbin says. Now, DB2 advances have convinced him that it is time to try something more ambitious. "Given what we've seen, I don't expect any problems," he says. \*

## Market booster

**I**nvest in relational DBMSs may actually be helping to fuel a growth surge in the OLTP market, which currently is valued at around \$20 billion, according to Kenneth Rennsweiler, president of International Resource Development, Inc. He notes, "Most people installing OLTP today are going for the relational type of DBMS."

The growing interest in relational DBMSs is probably directly related to recent moves by IBM and Digital Equipment Corp. to develop their own relational DBMSs, notably in the strength of a large number of users in one of the DBMS markets that are particular RDBMS/OLTP software, Rennsweiler reports. Tandem Computers and Stratus Computer continue to lead the mid-tier end of the business.

But a host of young hardware and software companies, such as Sequent Computer Systems, Interim Technology Corp., Oracle Systems, Relational Technology, Interbase Software, Inc., are making a significant push into the market. These companies have grabbed some market share.

Other companies, including Cullinet Software, Inc., Software AG of North America, Inc., and Computer Associates International, Inc., are reworking existing products to provide relational capabilities to their management systems now RDBMS products.

DBMS vendors such as British Lee, Inc. and Teradata Corp. are also making their products fit OLTP, often at the back-end and processor.

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# Misunderstood and maligned, RDBMSs fight a bum rap

BY FABIAN PASCAL

Twenty years after the relational approach to database management was developed, myths and misconceptions are still circulating about what the term really means and what the approach really accomplishes. What follows is an examination and refutation of a few of the more common misconceptions regarding relational database management systems. Most of the erroneous statements are actually extracts from what has been said in the press, not merely personal interpretations.

**MYTH:** On the personal computer, relational means multitable. It is a commonly held belief that relational should be defined differently for PC users than for those working in the minicomputer and mainframe worlds.

**REALITY:** In fact, the relational approach is a universal data foundation, independent of computing platform. Attaching a different meaning to it for the PC is not only a throwback to machine-dependent DBMSs, from which we are desperately trying to escape, but also "multitable" is dead wrong.

Furthermore, there is nothing relational about connecting multiple files by writing procedure code and loops. This extra work is exactly what the relational multitable proponents refer to when, and those opponents should sit at the heart of relational database management anywhere. When they are not part of the relational definition, it becomes useless.

**MYTH:** The relational approach is too theoretical. SQL can be particularly recalcitrant, the reasoning goes, so users must have a thorough understanding of mathematical sets.

**REALITY:** This is nonsense. If anybody needs to understand set theory, it is in the vendors and for the precise purpose of providing underlying DBMS functions that simplify matters for users and enhance their power. Users need to understand only their data, tables and the logical operations available for them. That is about as unreasonable an expectation as asking the someone who is going to perform accounting application ought to know arithmetic.

**MYTH:** The relational approach is too difficult. In long form, the objection usually is that SQL is quite straightforward for simple data access but is more difficult for expressing complex relationships.

**REALITY:** In principle, this is true of any language. In practice, it is certainly less true of SQL than of most programming languages. As a relational language, SQL was designed — albeit, imperfectly — for the precise purpose of simplifying the expression of complex relationships. Try expressing SQL joins or divisions in your favorite programming language, and it will quickly become apparent which approach is actually more difficult.

**MYTH:** SQL is only useful for con-

nnectivity. If users have no need to deal with a remote host on a daily basis, especially if the host's database is nonrelational, non-SQL programs will do nicely.

**REALITY:** This misconception stems from a narrow perception of SQL as just a standard interplatform connectivity language. It completely ignores the usability and productivity benefits of the relational

features supported by SQL for any DBMS, whether stand-alone or networked.

**MYTH:** SQL offers nothing new. The argument here is that the basic SQL commands are remarkably like procedural syntax and are used in the same way. An SQL command, it is said, is a tiny program that opens the database and indexes and deletes the records. The procedural syntax just uses separate commands for those steps and is, in effect, a kind of optimized query.

**REALITY:** To begin with, SQL is not a program in any sense. A single SQL statement of what result is needed can hardly be compared to the separate commands required to form a step-by-step procedure of how the system should obtain the

result. Moreover, the programming code that is avoided across the board through SQL support is anything but tiny.

Another critical issue ignored here is system optimization. A relational DBMS handles optimization itself. Programs created for procedural DBMSs burden the user with it.

**MYTH:** The relational approach emphasizes the wrong things. Instead of being preoccupied with SQL and other relatively obscure database technologies, the next generation of database products needs to deliver powerful features, such as custom menus and data entry screens that nosprogrammers can readily understand and use.

**REALITY:** The powerful features that are usually mentioned as more suitable

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Pascal is a Washington, D.C., consultant and author specializing in relational database management and SQL on the personal computer. He is affiliated with ComEd and Data International.

for attention than relational technology are not database functions but user front ends that must map relational functions in the DBMS back end. Menus and forms need some underlying database technology or else they cannot work. And it is relational features that enhance the power and utility of such tools.

**MYTH:** SQL is hard to learn and use. Inexperienced users must be trained to use SQL directly and are likely to be less productive.

**REALITY:** There are three problems with this reasoning. First, it assumes that SQL is difficult for all users and all purposes. There is ample evidence that this is not true, even for end users. Second, it is simply not true that users must learn SQL syntax. Any relational DBMS can insulate

users from SQL syntax. Most do, and those that do not have only themselves to blame. Third, SQL is not less productive than programming, nor are the tools built on top of procedural engines.

Without a proper understanding of what relational really means, how loyal SQL is to it and what its genuine practical importance are, users will not be able to benefit from these misconceptions and are likely to fall prey to them.

Therefore, users should educate themselves to use the precise relational features and facility rules as the correct criteria. If they do, they can properly evaluate, select and use DBMS products and be able to decide what tools to demand from vendors in order to achieve maximum usability and productivity. \*

## Machine niche tightens

BY MARK BREIBART

Database machines are like specialty players on a basketball team — they play well in certain spots but are only called on for unique situations.

These specialized combinations of hardware and software dedicated to database activities were never intended to replace database management systems that run on general-purpose computers. But

for large database applications that call for frequent relational joins, they have been able to claim their share of wins over the years, based on cost and efficiency.

Now however, some of the more aggressive vendors of relational DBMS products are moving into the database machine on their own turf, and analysts say the specialists will have to struggle to hold their ground on the court.

The two major database machine providers, Sharebase from British Lee, Inc. in Los Gatos, Calif., and Teradata Corp. in Los Angeles, aim at different market segments and use different hardware architectures, but they claim similar advantages for their systems. These systems are not inexpensive — a midrange Server/700 configuration from Sharebase costs around \$300,000, and a Model 2 system from Teradata with 22 processors goes for around \$1.2 million.

But for the job they are good at, say users and analysts, such systems can cost less than the alternative of combining RDBMS software with general-purpose computers. Performance is greatest when they claim, but machine vendors are able to optimize both hardware and software for a single purpose — handling relational database activity for multiple users.

### On the up-and-up

These and other factors convinced the Chicago Board Options Exchange (CBOE) that it needed a database machine to handle a decision support system, which required large databases. The CBOE's main business — the activity on the floor of the exchange — is handled on several IBM mainframes running under TPF and MVS. But for a secondary application, checking the trading for violations of securities rules, Teradata's DBC/1012 machine fit the bill. "We knew we had to store large amounts of data without compromising the CPU cycles of our MVS production machine," says Jim Reiske, the user's director of data resource management.

Policing trades requires nightly updates of data from many sources and then batch reports and ad hoc queries on relational database tables as large as five million rows. The Teradata machine's parallel processor architecture is particularly adept at this kind of chores, analysts say, because it can handle massive updates and full database scans by breaking tasks into smaller pieces and managing them concurrently on different processors.

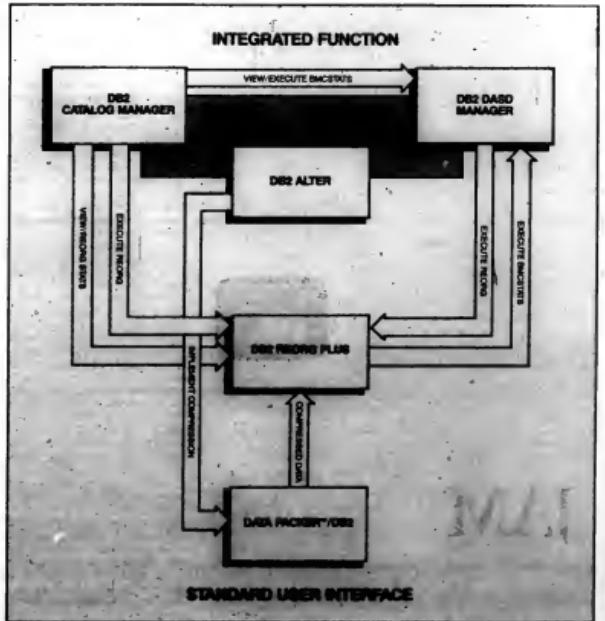
To handle that load as efficiently with RDBMS software running on a general-purpose machine, Reiske estimates the CBOE would have had to upgrade its IBM to something like a 3090 Model 600. That option, she says, was just not palatable. "We were not interested in buying a CPU that large just to dedicate 50% of it to a database."

For Mervyn's, a Hayward, Calif.-based department store chain, the selling point was price. It put a Teradata behind its IBM 3081 and 3090 early last year to handle two inventory and financial systems. Teradata was about 2½ times less expensive than doing it with DB2, says Jerry Wilson, director of information and

*Continued on the next page*

# ation Combination

### INTEGRATED FUNCTION



## Machine niche

FROM PREVIOUS PAGE

administration. "We would have had to add to the 3081 and probably evolve to a 3090, but [millions of instructions per second] on the Teradata is cheaper than MIPS on the mainframe."

Sharebase machines have also been known to grab a share of the mainframe market. When David Wyner, vice-president at Credit Lyonnaise in New York, chose a Britton Lee 10M 500 database machine in 1985, he was developing a system to give commercial lending officers and other officials at the bank's U.S. offices on-line access to all customer banking data. Although he was already plan-

**S**OME OF THE more aggressive vendors of relational DBMS products are challenging the database machines on their own turf, and analysts say the specialists will have to struggle to hold their places on the court.

ning to buy a Digital Equipment Corp. VAX for other applications, Wyner calculated that to match the performance of the Britton Lee product, he would need to buy at least \$400,000 worth of VAX hardware — double what the database machine then cost.

Despite these kinds of benefits, database machines have never claimed more than a corner of the DBMS arena. In a

market that Teradata's Barnes estimates at \$8 billion to \$9 billion, his company's revenue amounted to only \$120 million for 1988. Sharebase, with an installed base of 1,000 systems, had even less revenue for 1988 — \$30 million.

Now, especially for Sharebase, which targets its systems at the department level, software companies are providing stiff competition. Greg Olson, marketing vice-

president at Sharebase, concedes the market is getting rougher. "Back in 1981," he says, "we had a sheer performance advantage, particularly if you had a really hard problem in a mini environment. It's not so obvious anymore."

Sharebase, for example, some of whose founders came from Britain, has implemented a cache-coherent architecture in software that matches up quite well against its rival, says analyst Jeff Tash, president of Database Decisions, Inc., a division of Hewitt Associates in Chicago.

The impact of the challenge from Sharebase is already evident in at least one way. Late last year, Britton Lee changed its name to Sharebase to try to shift the emphasis from performance to the machine's ability to act as a centralized server for a variety of platforms, Olson says.

On the whole, Teradata has fared better than Sharebase, thanks in part to its parallel processor architecture. Not only does that increase the machine's speed for jobs that can be divided up, but it gives Teradata an element of modularity — users can increase the power of their current machines simply by adding processors, up to a maximum of about 1,000.

Also, Teradata's processors use industry-standard chips from Intel Corp.: the 80286 for its Model 2 and the 80386 microprocessor for its Model 3. That keeps Teradata's hardware development costs down and makes it privy to the ever-increasing power of those chips. Sharebase, by contrast, has to provide its own improvements to its proprietary hardware.

Nevertheless, Teradata is also now getting a run for its money. Its systems, now installed at 140 sites, are aimed directly at potential customers for IBM's DB2 relational database software.

### Waiting in the wings

Teradata is not the only vendor of relational technology hoping to steal a slice of the mainframe RDBMS market, however. Companies such as Oracle Corp., Relational Technology, Inc., Software AG of North America and Tandem Computers, Inc., have all developed improved products, according to analysts. And in IBM DB2. And, notes San Jose, California-based consultant Celia White, as companies like Pyramid Technology, Inc. and Sequent Computer Systems, Inc. go to parallel processors using cheap microprocessor MIPS, Teradata's advantages will shrink. Still, White adds, the competition has a way to go.

Bell Atlantic Corp.'s marketing division in Madison, N.J., reached the same conclusion in mid-1986 when it chose a Teradata system over DB2 to handle a database of its 1.3 million telephone business customers. The group wanted to put in one location all the customer marketing data, which was then spread throughout the firm on a variety of production systems running on IBM, Honeywell, Inc. and DEC equipment. The goal was to provide an on-line decision support system that would let the marketing staff look at any slice of the customer base.

DB2 beat Teradata on the duration of the IBM 3081. But, according to Ed Marchetti, the division's information systems manager, when the Teradata outperformed DB2 by a margin of 7-to-1 on some prototypical benchmark queries, the choice was clear.

For potential users, the issue may no longer be so cut-and-dried, and database managers may have to work harder to stay in the game. \*



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# Before you make the switch ...

BY ROBERT GILMORE

In planning the transition to relational database technology, MIS managers need to give careful thought to structuring the operating environment to maximize use of the new technology.

A first step in making the transition is to optimize the use of the existing environment prior to installing the relational product. Relational database systems require significant processing resources. Rather than face immediate capacity problems, assemble the best individuals available, and optimize both on-line and batch environments before implementing your first production relational system.

Both the operations and capacity planning groups must be involved up front with the implementation. Traditionally, these are the last groups to become involved, and they do not appreciate surprises in terms of DBMS and application resource consumption. Anticipate what a relational DBMS is going to do to your operating system environment and plan a strategy to accommodate the growth.

Next identify the systems administration function that will be responsible for the testing, implementation and control of the relational environment. This group should oversee the standards, policies and procedures needed to manage the transition. It should ensure that resources are properly utilized and that database/data communications activity can be accurately monitored and measured.

Consider isolating decision support systems (DSS) from production, or response-sensitive, applications. As the number of users increases, the data manipulation capabilities associated with complex ad hoc requests will cause degradation of the production system if both are running in the same address space or under the same copy of the software.

Learn the relational product's capabilities and limitations. Be prepared to implement centralized control over the production environment and distributed control over the DSS and test environments. Remember, once control is lost — or if it is

never achieved — it is, in most cases, unreasonable to expect that it will ever be properly established.

#### Data conversion issues

To actually build the environment, much consideration must be given to data conversion. This is never a job that takes the time anticipated — instead, count on at least five times longer than expected.

Ideally, a task force or project team should address the following tasks related

to data conversion:

- Identify the data elements to support the project or projects being migrated.
- Identify the source of the data and the data's owners. Establishing ownership is important — this is where parameters for the validity of the data are determined.
- Spend time trying to identify valid ranges of data and values — where appropriate, so that adequate edit rules can be applied as the data is being loaded into the new environment. Moving "dirty" data from one environment to a new one makes no sense.
- Identify what data will reside in each environment (production (DSS) and what data will be shared or duplicated.
- Identify all internal and external audit requirements for the data. Doing so will

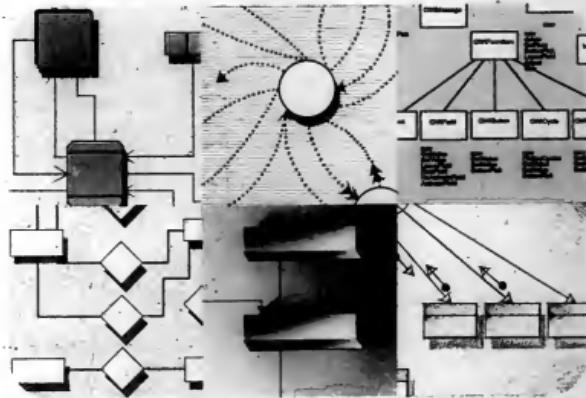
allow you to build audit procedures or identify alternate processing solutions.

Relational technology gives MIS personnel the opportunity to become involved in critical design tasks such as logical design and normalization. It also provides an opportunity to use the phases associated with system development methodologies as the discipline for completing these tasks.

Organizations can now place more emphasis where it belongs — on the data. While the transition may not be a simple process, it does not have to be painful. \*

Gilmore is vice-president of Consultingplus Services, a management consulting service offered by Data Base Management, Inc. in Manchester, Conn.

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<sup>10</sup>See comments above under *Execution and Control*.

The companies included in this chart responded to a recent telephone survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Further product information is available from the vendors.

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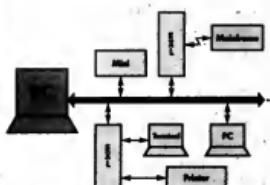
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## Systems design: Users in the hot seat

*JAD platform plus CASE tools automate early collection of user expertise*

BY JAMES D. KERR

**F**rom code generation to reverse engineering, there are many exciting trends shaping today's systems development world. One of the most intriguing is automated joint application development (AJAD). AJAD integrates computer-aided software engineering (CASE) tools and JAD techniques to form a new development platform that is sure to change the way systems are built in the future.

By definition, JAD — originally developed by IBM in 1977 — places the end user and the systems analyst together on the same project development team. The team defines and documents the systems requirements through the user's eyes rather than the analyst's. While use of this technique may seem obvious, it is not yet well-established in the information systems world.

Under JAD, once the systems requirements are defined and reviewed by



ETIENNE DELARUE

the users and analysts, they are turned over to a design team made up of database administrators and programmers who convert the requirements into an actual system of databases and programs.

The JAD methodology is based on the assumption that IS can build better systems by harnessing user expertise in the development process. It encourages computer literate among business professionals, thereby reducing

the familiar organizational barriers to systems design — obstacles well-documented by user comments such as, "We're sick and tired of these faulty systems." With JAD, users take more responsibility for the resulting system because they have played a part in building it.

CASE, on the other hand, automates what the IS professional does. CASE workbenches provide systems developers with the tools they need to define

the data and process specifications for a system. CASE immediately improves IS' capability to communicate with users by diagrammatically representing their requirements. And because it is automated, CASE allows for easy modification of previously defined system designs.

A tremendous productivity opportunity arises when CASE is folded into the JAD process. The simple addition of automated

Kerr is director of data architecture at The Equitable in New York and an adjunct professor in information systems at Rensselaer Polytechnic Institute in Troy, N.Y.

- Design is their responsibility, too
- Eliminates cut-and-paste development
- "Fly solo" after first success

tools introduces a design discipline that is difficult to match by any manual approach. In fact, AJAD can reduce development time by as much as half, compared with traditional systems design methods.

#### Getting started

The following critical questions must be addressed by the IS manager in charge of the AJAD program:

- What tools should be used?
- Which project should be the pilot?
- Who's on the AJAD team?

When addressing the tool question, many IS organizations will of course be inclined to use the CASE tools they already own. That is fine, as long as the tools can graphically depict data and process models, print screens and generate reports. But many tools won't.

If the current tool set does not cut the mustard, IS should consider acquiring some new ones before embarking on AJAD.

Among others, tools such as Index Technology Corp.'s Excalibur and Texas Instruments, Inc.'s Information Engineering Facility make fine AJAD aids because their personal computer-based graphics components allow users to quickly define and modify systems specifications

without having to consult a mainframe repository.

Once the tools are in place, the IS manager should get together with a user manager to define a viable pilot project. As with any pilot, it is wise to choose a project that is off the critical path, one that can be developed quickly and has a relatively low possibility of failure. Operational systems such as payroll, accounts payable and order entry are preferable to strategic systems such as advanced stock market analysis, expert underwriting or computer-integrated manufacturing.

An IS manager can minimize the risk of AJAD failure by selecting a project that his development staff is familiar with or even one they may have programmed before.

#### The AJAD team

There are six main members of a typical AJAD team: the executive sponsor, IS manager, AJAD facilitator, AJAD scribe, IS developers and end users.

The executive sponsor is a senior-level manager from the user firm — often the manager who helped choose the pilot project — who can ensure the level of commitment needed to make the AJAD project a success.

The IS manager spearheads

#### A sample AJAD session

In this AJAD meeting at an insurance company, a facilitator drives the discussion with the user, the IS staff interprets it, and a scribe uses CASE technology to document and project the system design.

Facilitator and user conversation	IS staff interpretation	Scribe's data model
F: Can a client own more than one policy? U: Yes. F: Do we maintain information about potential clients? U: Yes, it's star-relationship. F: Do we put policy information in the books before we sell a policy? U: No.		<pre> graph TD     Client --&gt; Policy   </pre>
F: What other information do we maintain? U: Premium information is important. F: Does it do anything to relate to policy administration? U: A policy generates many premiums over the year it is in force. F: Does every policy generate a premium? U: Yes, and it's recorded at the time of sale.		<pre> graph TD     Client --&gt; Policy     Policy --&gt; Premium   </pre>
F: What about beneficiaries? U: Yes, we track them as well. F: Who needs to know who gets the check? F: Can a client have more than one beneficiary? U: Absolutely.		<pre> graph TD     Client --&gt; Policy     Policy --&gt; Beneficiary   </pre>
U: I'm not sure the design is correct. F: Oh, really? Why? U: We keep track of beneficiaries not by client but by policy. F: Can we have more than one beneficiary per policy? U: Yes.		<pre> graph TD     Client --&gt; Policy     Policy --&gt; Premium     Policy --&gt; Beneficiary   </pre>

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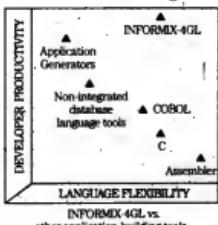


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the AJAD movement. This person is responsible for selecting the proper tools and choosing the team to kick off the AJAD effort; he also works with the executive sponsor to select an appropriate pilot project to test the new development approach.

• The AJAD facilitator is a user analyst or senior systems analyst who has terrific communication skills, knows the tools, understands the system requirements and has an appreciation for group dynamics. The facilitator is a team builder.

• The AJAD scribe is the tools expert. This person is a top-notch systems analyst who knows the tools inside-out. The scribe can transform a user's response to a question into a diagram representing a systems specification.

• IS developers are the professionals charged with actually building the system. They are the programmers, analysts and database specialists who need to better understand the user's requirements before creating a



systems implementation.

• Finally, end users are the subject matter experts. They know the business better than anyone else. They are the ones that will define the system specifications and comment on the designs as these elements evolve during the AJAD process.

In addition, many organizations just starting out in CASE or AJAD may find it necessary to use consultants on their first AJAD project. Consultants can play active team roles like scribe or facilitator, or they can be used less frequently as advisors or trainers. Either way is acceptable, as long as the consultants possess the necessary expertise and can effectively transfer their skills to the rest of the AJAD team.

There are many sources of good consulting support available in the marketplace. CASE vendors are prime sources of tool training and expertise, while project development and methodology consultants can be sought as AJAD advisors and facilitators.

Keep in mind also that you can fly solo after the first success.

#### The first AJAD session

After the team members are identified and tapped, the IS manager should carefully plan

**M**ANY ORGANIZATIONS use consultants on their first AJAD project. Consultants can play active team roles like scribe or facilitator or can be used less frequently as advisors or trainers.

the first AJAD session. Realizing that commitment is the key to any successful AJAD project, IS should try to boost team morale with a good, strong start.

An executive statement of support is a great way to kick off the project. The executive sponsor should make an appearance at the first AJAD meeting, stat-

ing management's expectations and reinforcing the organization's dedication to the AJAD program.

Because the AJAD process

will end up requiring four hours of work a day, five days a week, the team members should know that they have management's support from the very beginning.

After the executive send-off, the team can begin work. The IS manager first introduces the AJAD facilitator. It is important that the facilitator come well prepared. This person sets the

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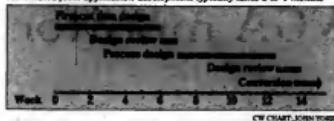
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**The AJAD life cycle**

Automated joint application development typically takes 3 to 4 months



time for the whole process, reviewing the project's scope, objectives and assumptions with the AJAD team.

For instance, the facilitator should take time at the outset to mention that AJAD is a highly interactive and visual process, one marked by facilitator questions, user reaction and IS interpretation. The scribe translates what is being said into system dis-

grams and prototypes, which are projected onto a screen in the AJAD meeting room. IS developers contribute to the process by raising key design issues and helping the team make appropriate design decisions as the project evolves. The chart on page 88 depicts the evolution of a typical AJAD meeting.

Notice in the chart how the data model evolves as the discus-

sion regarding an insurance application unfolds. The first scenario shows the definition of the client and policy data relationship. The premium entity is added in the second level. The third iteration adds the beneficiary information to the model. The fourth scenario illustrates how easy it is for participants to raise important issues and improve the quality of the design.

This sample session exemplifies the ease with which models can be developed through an AJAD process. It eliminates the cut-and-paste method associated with unautomated development approaches. Plastic templates are replaced by precision design tools such that design in a vacuum makes room for interactive development.

**AJAD life cycle**

Compared with a JAD procedure without automation, which typically takes six months to a year to complete, an AJAD project typically lasts three to four months (see chart this page). The first six weeks are used to define a first-cut data model. The deliverables include an entity relationship diagram as well as an entity list and attribute definitions. The AJAD team must work diligently in order to complete the models in the six weeks.

Once the first-cut design is completed, the next week is spent reviewing the design with key users — excluding those on the AJAD team — and the executive sponsor.

Objectivity is the reason for not including AJAD team members in the review process. The ego involvement of team participants can sometimes hinder their honest appraisal of the design.

Upon completion of the review, the AJAD team reconvenes and begins work on the processing components of the design. The deliverables of this phase include process hierarchies and dependencies as well as program logic definition.

A finalized design review is conducted by Week 14. Design refinements and executive sponsor sign-off is necessary before

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\*Daten, *For Sale of Network Management Systems*, September, 1988.

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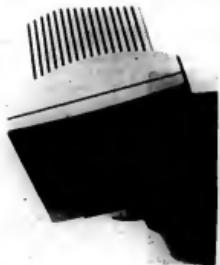
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the models can be converted into database designs and programs.

Conversion can take weeks or months, depending on the complexity of the designs and the sophistication of the CASE tool. It should be noted that tools providing automatic code and design generation can cut in half the time required to convert even the most challenging projects.

The power of AJAD is

achieved when CASE tools are first used in a scheduled JAD session. This can happen by accident — as when a forward-thinking project manager or programmer/analyst suggests the team consider using a CASE tool in the next JAD session — or by design. A JAD session, however, within no time, a development environment is created that combines the quality of user-driven design

with the productivity of automated systems construction.

The AJAD process shifts the burden of proof of systems development away from the IS staff and toward the users, who are ultimately responsible for the operation of the system. AJAD provides a mechanism for users to resolve their conflicts while improving IS' ability to build timely and accurate systems

through the use of rigorous CASE tools.

AJAD is an idea whose time has come. By implementing the approach, you can combine the quality of user-driven design with the precision of CASE technology to create a highly productive development environment that is capable of delivering the systems that will keep our firms competitive for years to come. \*

## Project log

Below is a typical automated joint application development (AJAD) project log, which follows the week-by-week AJAD life cycle (see chart page 93):

• Weeks 1 and 2: Team building exercises, data modeling training, review of business models and initial data model graphics. No discussion of attributes.

• Weeks 3 and 4: Refinement of data models, attribution of entities and initial descriptions of attributes — for example, definitions, field lengths and data types. No discussion of volumes or entity-to-entity ratios.

• Weeks 5 and 6: Completion of first-cut data designs, attribution, definitions, volumes and ratio estimates as well as a validity check against business models.

• Week 7: User reviews of first-cut design, refinement notes and design changes.

• Weeks 8 and 9: Process modeling training, review of finalized data design, initial process hierarchy design and process dependency design. No discussion of process logic.

• Weeks 10 and 11: Refinement of process hierarchy, process dependencies and initial process logic definition. No discussion of program-cut volumes.

• Weeks 12 and 13: Completion of procedure designs, including hierarchies, dependencies and process logic; completion of run-volume estimates; and validity check against data design.

• Week 14: User reviews of finalized data and process designs, refinement notes and design changes and user sign-off.

• Weeks 15 and on: Construction of data designs into detailed designs, construction of process designs into programs using high-level languages or process generators, screen and report layouts using prototypes, options testing and turnover to production.

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# MANAGEMENT

## TAKING CHARGE

William R. Brittain

### Our personal perspective

Like our technology, programmers come in generations, each with a set of values and work methods that match the evolution of the industry. The changes reflect not only the state of the information sciences but also larger sociological happenings that shape a generation of people.

I am familiar with three generations: the one ahead of my generation, my own and the one following mine. In each instance, the experiences that shape those working generations occur in the first working years, when the majority of workers are in their 20s.

Power and influences begin to emerge in a generation during their 30s and become consolidated in their 40s and beyond. The following generation is in the life and energy that pushes the others forward.

**The differences**  
The generation of programmers before mine began in the industry by actually wiring circuit boards and programming on machines that may have had a total random-access memory of 64K bytes for the operating system and all of the business applications that were developed. This generation does not take systems methodologies, programming standards, structured programming theories or systems design theory seriously.

But these programmers always get the job done with at least one or two examples of work that give them expectations when letting others know what the others did. They've never heard the notion that programmers do not like documentation. All of the books, theories and new declarations of the advancing information sciences are like new clothes on a child whose birth they attended.

My generation lived through Vietnam, women's liberation, structured programming and the conversion to virtual operating systems and database management technology. Somehow, there is a relationship there, but I am too close to the situation to see it. Perhaps it is that the changes both in our society and in the industry were fundamental.

*Continued on page 100*

BY AMY CORTESE  
OF STAFF

PARAMUS, N.J. — Frank Erbrick clovers around, donning a fur hat from China given to him by one of his staff. In fact, he looks more like the avid camper he is than the man that manages the information systems for an \$11 billion package delivery service.

As vice-president of information services at United Parcel Service of America, Inc., Erbrick is not your average IS executive. A former butcher, he has been with UPS for 26 years — most of that time in accounting and operations. Like most people at UPS, he spent time driving a delivery truck and has worked his way up the ranks. Described as friendly, outgoing, and even "a bit boisterous," Erbrick, 49, is known for always having a humorous story to tell. His office is a place where people at all levels of the company feel comfortable and can frequently be found. Walking through the halls, Erbrick has a hand greeting or stop on the back for everyone.

Erbrick displays an almost paternal concern for his staff and is known to send care packages of food and magazines to his overseas staff in the 42 countries in which UPS now operates. Systems programmer Bryant Hartman, a care package recipient who presented Erbrick with the fur hat upon his return, says Erbrick has always reminded him of his father. "They both have that

## PROFILE

Frank Erbrick



POSITION Vice-president of information services, United Parcel Service of America, Inc.

MISSION To provide information services to bolster the company's expansion while maintaining an atmosphere encouraging worker input at all levels

Perry Mason look," he says.

Erbrick started at UPS as an accounting supervisor, moving on to statistics in operations and customer service and most recently as controller for UPS' Pacific region.

In February 1985, Erbrick was assigned to IS, moving back east to take the second-in-com-

mand position at UPS Parsons, N.J.-based information services division. He was quickly promoted to vice-president of information services in August of that year and assumed responsibility for all computer systems.

Although he admits to not being thrilled with the assignment at the time, Erbrick says having

such a significant impact on UPS and experiencing the "pride of accomplishment" of his staff has made it "the most invigorating experience of my career. Anything I do after this will be anticlimactic."

Asked if he believes that he does not have a technical orientation, Erbrick says he believes in delegating authority, letting his staff make the decisions. "People have to know they're allowed to fail," he says. "You have to let people know you have faith in them."

Erbrick's staff says he does not need technical expertise to manage them. "The way he relates to people and can hold attention at a meeting" are more important, Hartman says.

Employee-owned UPS has a strong corporate culture rooted in the ideology of UPS founder James Casey, who strongly believed that the company's greatest asset is its people. This philosophy is reflected in Erbrick's approach to management.

"He's the kind of manager that works hard and sets a good example," says UPS Executive Vice-President Kent "Ole" Nelson, Erbrick's boss. "People relate to him well."

Erbrick has instituted a policy under which everyone, managers and Erbrick included, shares the work on holidays when the pace is stepped up instead of leaving junior employees with long and undesirable shifts. Er-

*Continued on page 101*

### IS looks to user base for consulting services

BY ALAN J. RYAN  
OF STAFF

CHICAGO — When it was time for a major systems reengineering at the Gas Research Institute (GRI) here, it seemed logical to look to consultants. What some might say was logical was that those consulted were nearly all GRI employees holding non-IS positions, from clerical workers to vice-presidents.

However, the result is a system that everyone can live with and that many non-IS employees take pride in having helped design, according to director of information systems Hugh Naughton.

GRI went with the nontraditional approach to systems overhauls, which Naughton labeled

"process flow analysis," to get a clear sense of what the users require in a system, not what the consultants people thought the users needed. "We talked to people at every level in the company," he said.

#### Company specs

GRI Research Institute performs research and development for the natural gas industry, from producers that extract the gas from the ground to consumers such as home and business users of gas. The non-profit company employs approximately 275 people and works with a \$175 million budget to manage some 500 active R&D projects at any given time, Naughton said.

In 1984, GRI officials decided that something must be done

### Data View

#### Pros and cons

*The greatest strengths of MIS in the industrial services sector are also its greatest weaknesses, according to a survey of 50 information systems execs*

	Strengths	Weaknesses	
People	26	Skills	23
Systems	11	Systems	6
Projects	8	People	8
Design/execution	5	Stakeholder commitment	5
Stakeholder commitment	3	Design/execution	4

\* Includes businesses such as personal and maintenance items.

SOURCE: REUTHER-STANIS RESEARCH CO.

CW CRATE/PRIDE/C. O'GORMAN

with their systems. There were discrete systems for all of the different areas of the company: budgeting, planning, contract management, financial management and membership management. Naughton's job in 1985 was to get started on plans to integrate all of these. Wang Laboratories, Inc. systems will rid the company of expensive depli-

cation. He was also told to retain the company's significant investment in Wang hardware.

A two-day workshop with departmental representatives was called in the fall of that year. "It was an interactive working design to elicit their ideas on what the system would look like when it was completed two years

*Continued on page 98*

## IS looks

CONTINUED FROM PAGE 97

hence," he said. That workshop proved that the decision for integration was one that was widely supported.

Calling together non-IS workers to help design a new system brought about some apprehension from the workers, and there were also some tensions because entry level and support staff personnel suddenly had to work closely with upper-level management, Naughton admitted. Once the group started working, however, those tensions and apprehensions quickly melted away because the members started off with the same limited knowledge of systems, he said.

Two years, many meetings and several system prototypes later, the integrated system was put into place. Much of the system was designed by outside consultants based on the needs outlined by the work group.

### Wang migration

Under Naughton's direction, GRI has moved from one Wang VS 100 and one VS 85 microcomputer to one VS 300, one VS 7310 and two VS 85s. While he admits that building on a base of Wang equipment gave him some sleepless nights during the development process — "There was always the possibility that we had overreached in terms of the hardware, operating system and database management capabilities, and even today we have a

problem with slow response time" — Naughton said he is generally pleased with the Wang hardware. The company is slated to be one of the first customers of the new Wang VS 10000, which will significantly improve throughput and CPU time, he said. The software being used is Wang's Pico relational database management system.

Two months after the system was installed, another workshop was held, this time to solicit reaction to the system which the workers had helped to design, Naughton said.

The people who attended the workshop were primed to talk about the system, Naughton said. "It introduced technology to them that they had not experienced before, and it brought to the

company's business operations a discipline that had never really been enforced before." Some of the feedback was negative, but since the employees found that the new system forced discipline.

The integration of the data turned the system's various database portions into checks on other portions of the database, Naughton explained. For instance, when preparing the budget prior to the upgraded systems, any change in the budget numbers would be made in a word processing system but would not automatically be updated in the mainframe. "By the time the word processing document was published, the numbers in the computer became almost meaningless," he said. The new system assures the integrity of the database at all times.

### Attitude improvement

The system has been in place for more than a year, and user-friendly additions have been made to it during that period, Naughton said. Even extensive prototyping cannot create perfect systems, he warned.

"When using prototypes, you've got to ask the question, 'Are we doing things right, or doing the right things?'" he said. When a user is shown a prototype, he can become enraptured by the new technology and lose sight of crucial business elements that are missing, much as the developer becomes excited about the prototype and may leave out a critical algorithm, Naughton said.

But even now, the systems are still being closely studied. A review committee of users was set up in January to look at proposed software projects and rate them by priority. Also, a database administrator's forum was established once the system was implemented to help inform users of changes, modifications or enhancements to the database or the system.

## Kaiser Aluminum sells data center to start-up firm

COLUMBUS, Ohio — The recent sale of Kaiser Aluminum & Chemical Corp.'s Midwest Regional Data Center here has meant a smooth transition for the 16-member staff.

Kaiser sold the data center as part of an approximately \$250 million asset sale package — including two aluminum reduction plants in Bauxite, W. Va., to Bauxite Aluminum Corp., a new firm headed by a former Kaiser vice-president who managed the Ravenswood operation. Ravenswood Aluminum was formed by Stanwich Partners, Inc., an investment firm in Stamford, Conn., that paid \$168 million in cash and assumed debts of \$88 million.

The data processing operation was renamed the Ravenswood Data Center, but that was about the biggest change, according to Operations Manager George DiBacco. "We did 70% of our work for the Ravenswood plant already," he said. "We will retain some of the work for Kaiser."

The data center supports Ravenswood's aluminum processing units, IBM 3081 D and 3083 EX running MVS/XA, DOS/VSE and VM.

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## MANAGEMENT BRIEFS

## Certification group airs revamped exam mode

The Institute for Certification of Computer Professionals (ICCP) in Des Plaines, Ill., announced that it has begun preparing new versions of its certification examinations that will go into effect in January 1990.

The new structure, which the ICCP said will be more challenging, is a response to market demand for certification in new areas of specialization, market demand for testing depth vs. breadth in specialty areas and a need to improve efficiency in developing ICCP exams.

The exam structure will be based on a single core exam required for all designa-

tions and will be put in place for certified data processor, certified systems professional and certified computer program manager designations and associate computer professional certification.

The core exam will be designed to test "the main areas of knowledge required of every information systems and information technology professional," ICCP President Maize Maier said.

The overall testing period will be two hours longer in the new structure, because all candidates will be required to pass two specialty exams in addition to the core exam, Maier said.

Current candidates for certification will continue to use the existing test. The revised exams will be given for the first time in May 1990. Any candidates in the process of testing will be able to continue in that structure through the period defined in the application announcements.

The Computer Measurement Group, Inc. (CMG) is seeking papers to be presented at the CMG '89 International Conference slated for Dec. 11-15 in Las Vegas. Papers should describe new ideas or techniques or should report on experi-

ences of success or failure in the computer performance evaluation area. Abstracts are due by April 3. Inquiries should be directed to George C. Chiaro, CMG '89, CMG Headquarters, 111 E. Wacker Drive, Chicago, Ill. 60601.

The Twelfth Western Educational Computing Conference, slated to take place Nov. 16-17 in Burlingame, Calif., is seeking papers dealing with computers and computer applications in areas of interest to instructors and administrative personnel dealing with computers at the college or university level. For more information, contact Dr. Oliver Seely Jr., CSU Dominguez Hills, Chemistry, 1000 E. Victoria St., Carson, Calif. 90747. The deadline for submissions is April 21.

## Brittain

CONTINUED FROM PAGE 97

tal and are still being reckoned with in many quarters.

The elements that were introduced have become a permanent part of the scene: women in business, database management systems and a growing awareness of the need for interpersonal communication, even as business had to recognize the need for telecommunications.

Most recently, this mixed marriage of men and women, formalism and informality and technology and innovation has given birth to a little monster called the personal computer and a new generation of software that is like a teenager who has not quite yet lived up to his potential.

Unfortunately for the newest generation of programmers, the world of data processing still has a lot of the old along with the new. Some of these programmers predict that their careers will be short-lived. It must certainly be confusing and a lot more difficult to navigate — than is most out there.

From the earliest days of beginning, the PC world has grown into one as varied as the real world, having distinct subcultures along with a particular native language. The choice of these new programmers in the industry is the same as the personal choice of any young man or woman: finding some stability and security while learning about the rest of the world. It is no small task for anyone, personally or professionally.

It is appropriate that one of the most well-known fourth-generation software packages is named *Focus*. That is the problem, isn't it? Where do we focus our efforts, our careers, our personal lives and our goals?

Years ago, when Victor Frankl wrote *The Search For Meaning*, he was talking about the search for a focus in our lives. The 1980s have brought a new focus on the personal aspect with PC technology.

That personal focus is everywhere in business, in our health clubs and in the popular media, only now it seems to be reaching out to something, pulling the world back together.

Mass media is becoming personal media. We are once again valuing personal creativity but as an experience that must be shared and that combines all of those elements of individual ability, communication, meaning and focus.

Brittain is a senior programmer analyst at Capital Holding Corp. in Louisville, Ky.

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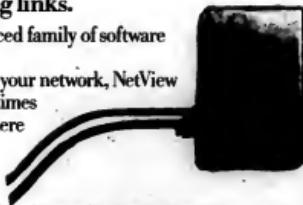
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## Erbrick

CONTINUED FROM PAGE 97

brick himself works shifts loading tapes.

UPS is a very method-oriented company. Routine procedures are systematically studied for ways to make them more efficient. For instance, drivers observe particular guidelines designed to save time such as stepping up onto the truck with the left foot, which eliminates unnecessary steps, and picking up a package at a discount counter so it can easily be spun around to a truck side door.

Erbrick has attempted to bring such methods into IS. Service to IS customers is constantly measured, and weekly reports are generated and distributed to all

staff. The number of calls per day to the help desk are recorded as well as the time spent responding. User satisfaction is frequently measured by asking users if they got the help they needed.

Because of demands for increasingly skilled employees, UPS has only recently relaxed its hiring policy of requiring all employees to start at the ground level, either sorting packages or driving trucks.

IS is therefore made up of employees from the old school who have worked their way up as well as new hires from outside. Erbrick is aware of the potential for resentment between the two groups of employees; one way he tries to bring his staff closer is to get them involved in projects together.

UPS is known as a charitable organiza-

tion, and IS is one of the firm's most active groups. Recently, members of the IS staff and Erbrick spent several weekends painting and fixing up Seton House, a home for unwed mothers in Jersey City, N.J. During this project, Erbrick was just one of the workers, taking his assignments from an IS staffer who was appointed project leader.

Erbrick likes to say that all this makes his people feel good, but one can tell from the enthusiasm in his voice that it makes him feel good as well.

Erbrick is in charge of all of UPS' worldwide computer systems, including both air and ground operations. He oversees almost 800 employees at the main data center in Paramus, N.J., as well as 400 in the field.

Although for many, UPS may conjure up an image of familiar brown delivery trucks bearing gifts, the company has rapidly expanded into global markets and has literally become an airline with a fleet of more than 100 commercial-class planes.

As UPS has expanded, Nelson says that the company has begun to rely more and more on its computer resources. "We have gone from largely using computers to send out bills to running our business" with computers, he says. Today, computer systems do everything from monitoring UPS airplane engines to tracking packages worldwide. Under Erbrick's guidance, information services has grown from a group of less than 100 in 1985 to more than 700 now to meet these changing needs.

## CALENDAR

### MARCH 5-11

IBM Information Technologies User Meeting, San Diego, March 6-7 — Contact: IBM Information Technologies, 1500 E. 3rd St., La Jolla, N.Y. 92116.

Software Re-engineering Symposium, San Francisco, March 6-8 — Contact: Digital Consulting, 8 Wheeler St., Andover, Mass. 01810.

Value '89 Conference and Exposition, San Jose, Calif., March 8-9 — Contact: Information Publishing Corp., P.O. Box 43275, Houston, Texas 77293.

Federal Office Systems Expo, POPO Software and POPO Graphics, Washington, D.C., March 8-9 — Contact: National Trade Promotion, Suite 400, 2111 K Street, N.W., Washington, D.C. 20006.

Annual Convention of the Alpha Micro Users Society, Irving, Calif., March 8-10 — Contact: Alpha Micro Users Society, 7300 Market St., Boulder, Colo. 80302.

Conference on IBM Performance/Capacity Management, Phoenix, March 8-10 — Contact: Applied Computer Research, P.O. Box 6200, Phoenix, Ariz. 85446.

IBM Conference on Artificial Intelligence Applications, Miami, March 8-10 — Contact: The IBM Computer Society, 1735 Massachusetts Ave., N.W., Washington, D.C. 20006.

CAP/CAM/CAM Strategy Workshop '89, Cambridge, Mass., March 14-16 — Contact: Datapoint, P.O. Box 410, 1440 30th St., Cambridge, Mass. 02138.

Productivity: Micro-Offices, Systems, Santa Monica, Calif., March 14-16 — Contact: Datapoint, Group 201, 1400 30th St., Santa Monica, Calif. 90404.

Public Conference of the American National Standard Institute, Washington, D.C., March 14-16 — Contact: American National Standards Institute, 1420 Broadway, New York, N.Y. 10018.

### MARCH 12-18

The Second National Conference on Measuring Productivity, Quality and Productivity, Orlando, Fla., March 15-17 — Contact: Quality Assurance Institute, 7575 Dr. Phillips Blvd., Orlando, Fla. 32819.

Service Leadership is the 9th, for Senior High-Tech Services, Mountain View, Calif., March 15-17 — Contact: APIM International, Suite 25, 1542 California Blvd., Ft. Myers, Fla. 33907.

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Carlos Cadalzo is president of Integrated Systems Technology, Inc., a 10-year old CICS consulting company that recently began marketing PC-based development tools for on-line systems.

The company created the Quick Screen 3270, a development tool that helps analysts design screens for CICS and IMS/DC systems — without requiring a programming background. The next step was to determine the best way to reach the buying market for this new tool. And for Carlos, the first option that came to mind was Computerworld.

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Integrated Systems Technology, Inc.

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# COMPUTER INDUSTRY

## INDUSTRY INSIGHT

Dennis Noonan

### The emperor is really naked

Just about this time last year, a major computer company held a gala celebration to mark its entry into the billion-dollar annual revenue club. "Breaking through" was the theme of the day. Local employees were dressed in masse to a black-tie dinner, where they were treated to a free lunch, free entertainment and a large dose of rah-rah.

The company was clearly doing well. Excess cash was burning holes in the coffee; the chief executive officer proudly confirmed to the crowd that the corporation was moving ahead with an announced plan to acquire another half-billion-dollar computer company.

Hardly anyone in that audience would have believed that more than 700 of their fellow employees — including the CEO — would be looking for new jobs within six months. And few would have predicted that the company they had become

Continued on page 109

### Sequent CEO maps out competitive plan

Strength lies in its price/performance ratio

BY ROBERT MORAN  
CW STAFF

Sequent Computer Systems, Inc. intends to be a major player in the on-line transaction processing (OLTP) market, and Chairman and Chief Executive Officer Casey Powell is drawing a roadmap of the route the Beaverton, Ore.-based company will take.

"We intend to blanket the market with a combination of direct sales and opportunistic OEM agreements," said Powell, who was on hand last week to discuss Sequent's newly announced OEM agreement with Unisys Corp.

The strategy is not new, especially for young hardware vendors that have floated their companies on the economies of the

Unix operating system and have struck crucial strategic relationships with vendors of relational database management systems. In Sequent's case, these RDBMSes are Relational Technology, Inc.'s Ingres and Oracle Corp.'s

Oracle. But the big differentiator is Sequent's price/performance ratio, which beats its competitors' by almost 50%, according to company claims. The combination of its Unix-based operating system, which is called Dynix and is compatible with AT&T's Unix System V and University of California at Berkeley's Unix 4.2, and its proprietary Symmetric multiprocessor allows for a maximum operation of as many as 30 Unisys Corp. 80386 CPUs for an aggregate power of up to 120 million instructions per second



Sequent's Powell

by year's end.

According to Powell, "The inexpensive systems and marketing channels have paid off to date." For the year ended Dec. 31, 1986, the company reported revenues of \$76.1 million in revenue — a substantial leap over the \$38.5 million reported for 1987. Net income for the year was \$6.5 million.

In addition, the fourth quarter saw a decisive flourish, with revenue of \$24.2 million and a net income of \$2.2 million. Those

numbers were boosted by the company's fourth-quarter catch of Rockwell International Ltd., Tonawanda, N.Y., and Apple Computer, Inc. Of the

Continued on page 108

### User demands fueling network buyout fire

BY PATRICIA KEEFE  
CW STAFF

An increasingly demanding user community is one of the major forces fueling a recent spate of buyout rumors that is stirring up activity in the computer industry's telecommunications sector, according to analysts.

Some of the firms providing

grist for the rumor mill have been pegged as probable acquisition targets due to financial, product or marketing weaknesses. Others, however, while not necessarily large in size, are distinguished by stellar performances as niche players.

Rumors most heavily affected by the ground swell at Digital Communications Associates,

Inc. (DCA) in Alpharetta, Ga. The T1 and terminal-emulation product supplier has remained mum on reports that have the firm being sold in toto one day, sold off in segments on another and the subject of a leveraged buyout by former and current company officials the next. Both Siemens AG and Rockwell International Corp. are said to have offered \$30 a share for DCA, which was trading at \$20.75 per share at press time.

Analysts marvel at the volume of traded rumors almost as much as the amount of stock traded based on those rumors. DCA stock has come down from a trading high of 500,000 shares to about 200,000, one DCA in-

sider said. But most agree with longtime DCA watcher Mary McCarthy, an analyst at C. J. Lawrence, Morgan, Grenfell, Inc., in New York, who said there is little doubt that the firm will be the subject of a major financial transaction sometime this year.

Analysts say they believe the same user needs that have spurred many mergers and acquisitions are also driving the heightened expectation for more such consolidations. Users have become less willing to deal with a multiplicity of vendors, particularly when facing the task of integrating multivendor voice and data systems into seamless enterprise-wide networks. One result of such mounting impatience is a rise in user-based pressure on vendors to support competition.

Continued on page 104

### Layoffs-plus as Unisys cuts costs

BY NELL MARGOLIS  
CW STAFF

BLUE BELL, Pa. — Anyone who blinked last week probably missed one of the latest cost-cutting moves at Unisys Corp. First, the \$10 billion computer and electronics giant fielded an inventory reduction plan, then a voluntary retirement plan and finally a major work force reduction in an ongoing effort to keep expenses under control during a taming product creation.

Some 1,700 U.S.-based Unisys jobs were eliminated last week in line with the company's plan to cut its employee roster by 3% by the end of this year, a Unisys spokesman said.

The nationwide reduction hit approximately 190 marketing, administration and engineering employees at Unisys' headquarters here, a company spokesman said.

As a result of the imminent consolidation of certain Blue Bell-based engineering and development operations with a similar, larger operation at Unisys' Roseville, Minn., plant, some 100 engineering jobs at headquarters were cut immediately, the spokesman said. Another 400 engineers will continue work through July.

The company also announced the impending closing of an assembly plant in Mexico, which

will cancel 400 jobs.

Earlier in the week, Unisys, which recently reported disappointing fourth-quarter earnings attributed to the costs of a major transition within one of its product lines, revisited plans for a voluntary retirement and so-called "voluntary layoff" program covering between 900 and 3,000 U.S.-based employees.

#### News travels fast

Word of the voluntary retirement plan followed closely on the heels of news that Unisys had launched a substantial inventory reduction program.

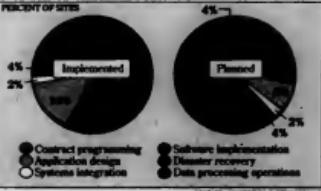
Analysts continued to applaud Unisys' cost-containment efforts and to advise at least guarded optimism with regard to the company's chances of emerging from an expected weak first half of 1989 into a more robust third and fourth quarter.

Unisys, and Philip Fearnhead, an analyst at London-based Kleinwort Benson Securities, is fighting a less extreme version of the battle that is battering Westwood, Mass.-based Cullinet Software, Inc. "They're trying to maintain an old, low-growth business while simultaneously launching what amounts to a new start-up business," he said.

### Data View

#### Service schedule

Contract programming is the most popular outside service used, but disaster recovery has become a major concern at IBM and plug-compatible mainframe sites.



## User demands

CONTINUED FROM PAGE 103

tors' equipment.

This, in turn, is forcing many vendors to become overnight experts or risk losing customers. These companies can launch time-consuming intensive research and development efforts to home-brew the required technology, strike strategic alliances with vendors that have the technology or, in an effort to maintain control, simply buy what they need.

"The vendors are all talking about Internet networking, but they don't have the time to go out and reinvent the wheel, so there has to be some consolidation on the way," said Richard Kimball, an ana-

lyst at Montgomery Securities in San Francisco, following a recent visit to Communication Networks '89.

The impact of user pressure on the computer market was reflected in the alliance announced last week (CW, Feb. 20) between Network Systems Corp., Excelan, Inc. and Wellfleet Communications, Inc., all providers of different pieces of the connectivity puzzle.

The impact can also be seen in purchasing and marketing trends expected to further local-area network penetration of the corporate sector. For instance, a recent report issued by Boston-based Business Research Group noted a shift in focus among the leading personal computer LAN vendors from supplying traditional low-end PC networks to functioning as

network integrators.

In some instances, PC LAN vendors are hobbled by their limited recognition factor within MIS, which is why "achieving control of LAN purchasing" is a large concern in LAN purchasing. "A large concern is organizational networking strategy will require that the vendor be regarded as a credible, long-term player," the Boston Research Group said. Partnering with a large systems or even high-end communications vendor can change that.

It worked for Tops, a provider of low-end networking among MS-DOS, Apple Computer, Inc. and Unix PCs that is now a division of Sun Microsystems, Inc. General-purpose LAN vendor Uengermann-Bass, Inc. was also purchased last year, in this instance by fault-tolerant systems

maker Tandem Computers, Inc.

User pressure is unlikely to lessen this year. If the past year is any kind of precedent, that could mean that the computer industry will see many connectivity vendors opting for the combination route in the coming months.

In addition to pressure from a more sophisticated and demanding user base, analysts find a very basic impetus for communications combination. They estimate that only 18% of the installed base of PCs have been hooked up to a LAN.

## Cullinet stands on shaky ground in third quarter

BY NELL MARGOLIS  
CW STAFF

Computerworld Perspectives 1989  
June 20-21, New York City

# Buying Smart: Pacing Your Information Systems Portfolio



**Shehane Zuboff**, of the Harvard Business School and author of *"In the Age of the Smart Machine: The Future of Work and Power"* will open PERSPECTIVES 1989.

the first session on June 20. Zuboff will discuss the challenges of building systems designed exclusively for corporate users of information systems with a point by point outline of where technology must be used in the next three years to enhance your competitive advantage.

Her opening remarks will analyze the evolution of the information-based corporation, with a special look at how changes affect both corporate power and influence. The two additional IS members in the country will then discuss strategies related to three critical themes which include:

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WESTWOOD, Mass. — Cullinet Software, Inc. warned investors to expect a net loss for the company's third quarter. The numbers that emerged last week, however, exceeded its own worst expectations and left the faith of even formerly bullish analysts shaken on the subject of the speed — and even the possibility — of the vaunted Cullinet turnaround.

Revenue for \$47.1 million for the quarter ended Jan. 31 marked a 13% drop from the \$54.2 million logged in the comparable quarter last year. The quarterly net loss of \$16.2 million, including a one-time \$5.6 million restructuring charge, made a stark comparison with last year's third-quarter net loss of \$12.7 million, which included a \$13.7 million nonrecurring charge.

In a prepared statement, Cullinet President Robert K. Weiler admitted that Cullinet underestimated how little it could depend on its more mature product lines — which include IDMS/R database-related products — to produce revenue over the past several months. However, he pointed out, "Revenue from products introduced in the last 12 months strengthened during the quarter."

Even so, analysts showed profound concern over this latest setback for the beleaguered software maker. "The numbers are ugly," said Bob Thierien, an analyst at Paine Webber, Inc.

The recent sorry performance, said Philip Fearnhead, an analyst at London-based Kleinwort Benson Securities, should not urge a rush to judgment on the executive ability of Weiler, who was recently named president of Cullinet. However, Fearnhead concluded, the failure of Cullinet's 11th consecutive quarter to post profits to live up to the firm's whitewashed-up expectations "means that the turnaround that's been in progress for a long time is going to be in progress for a long time."

More disturbing is "the nasty risk that if they go on this rate, they'll just run out of cash," added Fearnhead, who has been among those observers bullish on Cullinet.

Such a risk is not an immediate one, said Cullinet Vice-President and Chief Financial Officer Douglas Robinson. The company, he said, has a \$25 million line of bank credit, a small portion of which was exhausted at the end of the third quarter.

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and get your own

**COMPUTERWORLD**

Court: States may tax net traffic

On SQL  
Server's  
test trail





Bruce Sobolov of CBS News, Laura Giandomini and Brian Goldfarb of AT&T, share the afterglow of their own post-election victory. They take us behind the scenes for a glimpse at some of the reasons why CBS was successful on election night.

FEBRUARY 15, 1989

**AT&T:** Afterwards, the critics said CBS was the best, the fastest.

**CBS:** Right, but we sweated it out for more than a year. With more 20-hour days than I care to remember.

**AT&T:** Your situation was pretty complicated.

**CBS:** We were faced with election projections, exit-poll analysis, and other studio programming applications running on IBM hosts.

**AT&T:** Plus the NewStar system we tied in with our wide-area network, ISDN. It's distributed networked computing. Hey, we thrive on this stuff.

**CBS:** We're impatient around here. Speed is the only way you succeed with election coverage. The first thing we did was provide multi-host access with the 6500 System. Last election, everybody who needed access to two systems used two terminals. Twice the space, twice the cable, additional controllers, added expense, and wasted time.

We had programmers working simultaneously on three host applications, two bisync, one SDLC. They were constantly skating between terminals, wearing ruts in the rug. Now they have access to multiple sessions simultaneously from one terminal.

**AT&T:** The data moves over twisted pair, the same type wiring the technicians pulled for your System 75 PBX. That made sense.

**CBS:** An added advantage was having the same dedicated AT&T technicians installing and maintaining our system, providing consistency to my operation.

**AT&T:** But really, Bruce, why us?

**CBS:** Your responsiveness. At

custom host software we always used. We greatly reduced our cost.

**AT&T:** The other networks are watching, thinking, "How come CBS has the results already and we don't?"

**CBS:** It was a good night for us. Now the name of the game is streamlining for 1990. We're talking about a networked computer solution as a gateway into different host systems.

**AT&T:** With the AT&T Systems already up, running, and in place, we can almost completely automate your survey system.

**CBS:** That's a real big plus for all of us.

**AT&T:** Some-  
thing tells me I've seen that same  
glint in your eye before. (Laughter)

# Skating between terminals put ruts in the rug.

**CBS:** we all agreed that what we needed was someone who could deliver it fast, install it, test it, and support it. And you were hungry. You never said, "No, we can't do it." And you never took long to say "yes."

**AT&T:** You had computer networking problems. Solving them is the house specialty.

**CBS:** We do distributed computing to the nth degree. Our reporters are all over the country. They call in their results when the precinct closes. Before, we had over a hundred operators standing by with phones and terminals. That election night we introduced the voice response system running on AT&T PCs.

**AT&T:** How many calls?

**CBS:** Thirty, thirty-two calls at once, reporters everywhere having voice response conversations with the IBM host. And all done with the same

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## IN BRIEF

Small is big, company officials said. Co. officials estimate 7,500 increases in net income made 21% necessary due to orders for workstations and personal computers coming in strong in its fiscal first quarter.

Accelerated growth in orders for the midrange HP Precision Architecture systems, according to President John Young, also kicked into the Palo Alto, Calif.-based computer manufacturer's reported net income of \$193 million on revenue of \$2.7 billion for the quarter ended Jan. 31.

## Consortium offering

The Silicon Consortium Ltd., a 50-member, non-profit group formed to boost Materials, Inc.'s \$40000 revised instruction set comprising microprocessor architectures, has work commenced on object: The Software Initiative, a gathering of software vendors that have pledged to deliver new 38600-based applications this year.

The initial roster of company members include Westinghouse Corp., The Whirlpool Corp. and various smaller businesses—Technoglass Technology, Inc., Unity Corp. and Intrinsic Corp.

**Levittown**  
**personified**  
Sony Corp., wherein Ka-  
me had last week become  
president of Palo Alto,  
Calif.-based Sony Micro-  
operations Co., the division  
of the Japanese giant's U.S.  
subsidiary that man-  
ages Sony's Home family of  
operations.

St. John's, the  
Wool Exchange  
Peter Cope, pres.,  
of a committee  
to do a little  
good.

## Sequent CEO

FROM PAGE 103

fourth-quarter systems shipped, 65% were to first-time buyers, Powell said.

Despite such promising direct sales results, the company is still charting an OEM course. As recently as last week, it struck a deal with Unisys, which will add

deal with Unays, which will add

peripherals and market the Sequent systems as its own. Sequent said it anticipates that the agreement, which covers three years and contains two optional one-year extensions, will generate about \$10 million in 1989 and another \$240 million for the following years.

This particular OEM deal promises to generate more sales. An OEM alliance with Sie-

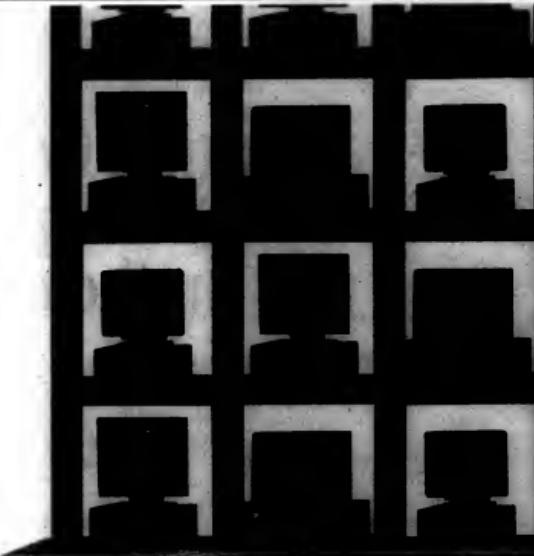
sales. An OEM alliance with SMC

hems AG in February 1986 changed the face of the compa-

Today, about 80% of the company's sales come from the commercial marketplace, Powell said — specifically, to those companies that need the combination of departmental machines and RDBMSs.

"We're in the fishing business," Powell said. "We thought we had a good fishing pole. Se-

"We're in the fishing business," Powell said. "We thought we had a good fishing hole. Six-



## Novell gateways undergo stress

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men said that we had a good spear."

Whether with a fishing pole or spear, Sequent hopes to net an even more elusive catch from a joint-venture firm formed in December with Matsushita Electric Industrial Co. in Japan. Called Pana-Sequent, the company will cast its net throughout Japan, particularly to earmark office automation customers.

The joint venture has its sights set. Although the joint looks to penetrate the commercial market in Japan, it currently has about 50 systems installed, primarily in the university market. The Pana-Sequent venture, Powell said, positions the firm to defend against continuing shortages in memory components and take advantage of Matsushita's developments in optical storage.

## Noonan

FROM PAGE 103

target of a hostile takeover from yet another corporate raider.

Last month, not quite a year after that magic moment, the new CEO announced that the company plans to lay off another 1,200 workers in an effort to

get leaner and meaner.

May the accountants and financial analysts think that the original takeover deal still looks good on paper. But I'm skeptical: I think all this takeover activity is a bad idea.

A company is more than totals on a balance sheet or a slice of market share on a pie graph. The company is really the people — the living ideas and relations-

hips that make things work the way they do.

Companies are the first to acknowledge this, at least verbally, but actions speak louder than words. High-level corporate takeover decisions seem to forget that the worth of an organization goes far beyond the last quarterly earnings figures.

### Shrinking violet

I think part of the problem is that there are not enough people around who are willing to say, "Maybe this isn't such a good idea." Like the courtiers in the fable *The Emperor's New Clothes*, one with any brains wants to be the bearer of disagreeable tidings. Can you imagine someone raising a hand at the annual meeting to ask, "Hasn't the company gotten big enough?"

Change in business is as welcome as a shark at a levee party. All the fine logos of academic and notwithstanding, managers in a hierarchy succeed by saying, "Yes, sir." Successful people do not question their boss. Asking questions is seen as cynicism or even disloyalty.

Those who blindly assent to whatever the boss thinks are seen as being on the side of goodness and light. Anyone who is foolish enough to question the growth goals of a successful empire gets the same treatment as the boy who yells, "Hey, the emperor is naked!" at a state parade.

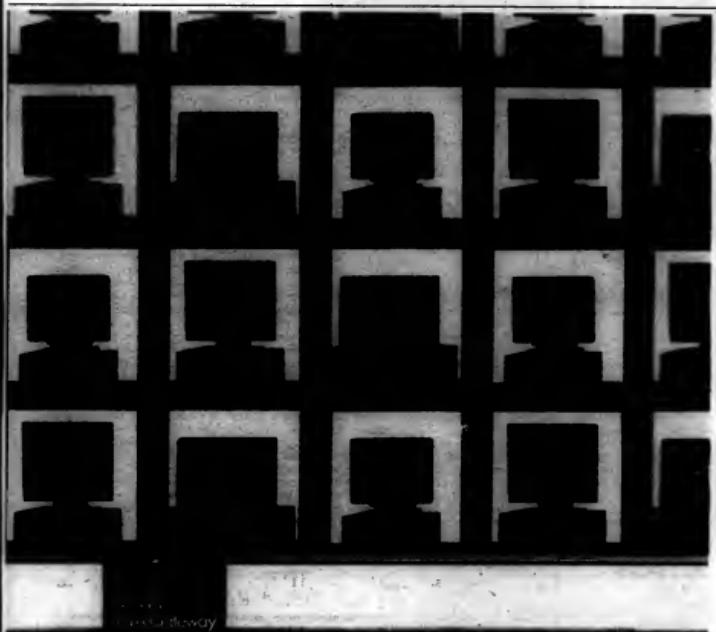
**There are n-champions'**  
But maybe things are changing. According to a recent news report, General Motors has publicly begun to question the effectiveness of its authoritarian management style.

The motivation to change is said to be Ford Motor's success. A few years ago, Ford, looking for a strategic edge, adopted a program to focus on community and teamwork, the article said. It seems to have paid off.

If Ford and GM are on the right track, maybe communications companies will start advertising companies do a lot more listening to their employees, especially the so-called critics. Beware of the carpetbaggers who have no stake in the success of the company. Listen to and reward the people who show enough interest to ask tough questions and propose alternatives.

But if you work for one of those companies where management thinks that it needs to keep expanding the empire, maybe you should discreetly find what the boss will be wearing to next year's kickoff meeting.

**Noonan** is a free-lance writer based in Wellesley, Mass. He was formerly a project manager at a microcomputer maker in the Boston area.



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# COMPUTER CAREERS

## Pick holds future promise

*The technology is popular with professionals and growing on management*

BY SHERYL KAY  
SPECIAL TO CW

 In today's competitive environment, where getting critical information to top executives in a timely fashion is crucial, it makes sense to use technology that can expedite the information flow. Pick, the operating system developed by Dick Pick in the late 1960s, is such a technology.

Pick Systems, based in Irvine, Calif., has licensed the operating system and its Pick Basic language to several firms that produce their own versions. Similarities among the versions far outweigh the differences, and they are making mastery of Pick and Pick-like systems a sound career choice for the 1990s.

Pick is a minimum operating system known for the ease with which it lends itself to development of applications and ports. One significant drawback, however, is a lack of communication capabilities.

By the middle of last year, there were about 130,000 mainframe and minicomputer Pick installations worldwide and about 80,000 installations of the personal computer version, which has been available since 1984.

According to Steve Crews, vice-president and general manager at Pick.

Sales of Pick operating systems by licensees grew 41% per year between 1982 and 1987, the last year for which figures are available, according to Dan Ness, a senior analyst at market research firm Infocomp, in Santa Clara, Calif.

"We expect the Pick market to continue to exceed the industry growth rate for several years to come," Ness says. The projection stems in part from the portability of Pick applications across hardware environments and the number of value-added resellers writing software for Pick, he says.

**Demand at all-time high**  
Demand for Pick professionals is at an all-time high, says Crews, adding that Pick Systems has started getting requests for help in new positions, including a significant number in Australia and the U.S.

"It's getting more difficult to hire guys for our own R&D lab," Crews says. "Normally, when they've got a very strong Pick background, they're making good money, and there's a lot of companies out there that want to hire them."

"I've worked in Cobol, Pascal, Fortran and assembler,"

says Kevin Shaw, MIS director at Deerskin Trading Post, Inc., a clothing retailer in Peabody, Mass. "Pick Basic has the best from all of these systems in terms of functionality and power."

Shaw, whose company is running Ultima Corp.'s version of Pick on a Bull H.N. Information

**PICK GIVES ME a very appropriate outlet for my creative impulses."**

RICHARD CANTY  
CORNUNTS

Systems DPS 6, finds that many professionals are attracted to the Pick world because the technology allows them to work rapidly. An entire system, including I/O and update, can be completed in a week. "When I show people how easy IBM or DEC's processing systems what we've done in a week, they are just taken aback," he says.

With eight years of professional data processing experience, Richard Canty, a senior programmer at Cornutus, Inc. in Oakland, Calif., has worked with many Pick-like systems. He has also spent eight

months coding Unix C programs. It requires a great deal more time for programmers to get Unix to accept an application, he says.

Canty, a published poet, adds that Pick provides a flexible environment that fosters creative programming. "Pick gives me a very appropriate outlet for my creative impulses," he says.

With the time saved by using Pick, programmer/perspectives can broaden their perspectives, says Bob Decker, vice-president of products and marketing at General

1991, a division of LCS, Inc. in Lakewood, Colo.

"It's no longer sufficient just to code lines in a program." Decker says. "My people like Pick because they can spend less time generating programs and more time learning our business."

Although most Pick shops will hire professionals proficient in other languages, they would prefer to hire experienced Pick people. "You want someone with experience because he will understand the nuances of Pick — what you can do easily and what can't be done," says Dick Gower, director of computer operations at Century 21 Real Estate Corp. in Irvine, Calif.

**Stick-to-itiveness**  
While he hopes to stick with Pick for the rest of his career, Cornutus' Canty advises professionals who are well-versed in the system to learn Unix as well.

"There appears to be an emerging option to merge the two where they are co-existing operating systems," he says. This symbiotic relationship is drawn on the best aspects of the two operating systems, including Pick's ease of use and the communications capabilities of Unix.

Experienced Pick professionals earn average to above-average salaries, with three years of experience commanding \$30,000 to \$35,000 a year. Senior analysts and project leaders with five years of experience of Pick experience are earning \$40,000 to \$50,000 a year.

Although such compensation may seem generous, firms using Pick save money because they do not need as many people to run the shop. "In your typical IBM environment, you need quite a few people in there just because the system requires so much hands-on work," Shaw says. "Pick is a great way for some people to experience being the manager of a shop or at least in control of several major corporate systems because we don't need as many people to develop and run Pick software."

Century 21's Gower jokingly urges executives to choose Pick as a career option. "Once you get into it, you will never want to leave and go back to anything else," he says.

**Skills** *By* **WALTER** *WILLIAMS*  
Business consultant and free-lance writer specializing in emerging technologies and human resources.

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# MARKETPLACE

## Rolm PBX market uncertain

Supply exceeds demand for IBM's CBX II after 9751 announcement

BY JONATHAN L. ROGERS  
SPECIAL TO CW

Twice in the past 16 months, users of the Rolm CBX II have had to eat into a major IBM change of direction.

IBM made the CBX II family obsolete by introducing the 9751 CBX in October 1987, while in December 1988, Siemens AG bought Rolm's manufacturing, research and development.

In the four months following the 9751 announcement, retail market values for the VSCBX, CBX II 8000 and CBX II 9000 RB 74 plunged 33%, 23% and 18%, respectively. Supply has exceeded demand for CBX II systems because of their "forklift upgradability" to the 9751 CBX. The switch, except for the peripherals, must be swapped out in order to migrate to the 9751 CBX.

Many CBX II users who have been compelled to improve functionality or expansion capacity

have been courted vigorously by AT&T and Northern Telecom, Inc.

Atstone sales representatives at both Northern Telecom and AT&T have helped end users from the Rolm market to switch. Northern Telecom targeted the CBX II installed base with a \$40 per port rebate for those users willing to switch to an SL-1. While the response to this rebate has not been enormous, it has generated some extra business for Northern Telecom.

**Waiting for more**  
Many Rolm remarketers are waiting for the second shot to drop as a result of the IBM/Siemens deal.

The remarketers are questioning whether IBM will back out of Rolm altogether to concentrate on multivendor private branch exchange (PBX)/host connectivity. They are also concerned about which of Siemens' current PBXs the firm will con-

tinue to develop and market (Saturn, 9751 or Icom), how Siemens will choose to leverage its current distribution assets in Telplus, Inc. and Rolm as well as what kind of support Siemens will give to the secondary market.

### Rolm CBX11 PBXs

Current fair market value

System	Q1 1984	Units	Value	Value %
VSCBX 8000	Q1 1984	304	\$605 (100 lines)	38%
CBX II 9000	Q1 1984	10,000	\$645 (350 lines)	42%

85% to 95% of list price. Therefore, remarketers have been on the prowl for Rolmphone laden CBX II systems to satisfy the market demand.

### Used to find

Both the VSCBX and CBX II 8000 have retail market values of 38%, while the CBX II 9000 with Rolm 74 has a retail market value of 42%. Currently, few CBX II 9000s with Rolm 295 or the Advanced Engine can

be found in the marketplace because the VSCBX's popular line capacity fulfills the low-end market niche.

In the past five months, current fair market values for Rolm equipment have been in a holding pattern. Values have held steady for the past four months as the initial impact of the 9751 introduction has been fully played out. With an estimated installed base of 18,000 CBX II systems, market values are likely to remain stable until IBM and Siemens reveal more of their plans.

For more information, contact IDC Financial Services Corp.'s Terri LeBlanc at 508-872-8200.

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be found in the marketplace.

Demand for the CBX II 9000 RB 74 stems from end users who want to set up a spare kit or add a node to their existing system.

Remarketers have seen more VSCBXs trade to users as sys-

### The BoCoEx index on used computers

Closing prices report for the week ending Feb. 17, 1989

Computer	Quantity	Price	Source	Supplier
IBM PC Model 076	7750	\$275		\$400
XT Model 086	81,100	\$1,250		\$900
XT Model 088	81,225	\$1,575		\$1,050
AT Model 090	81,725	\$2,000		\$1,525
AT Model 230	81,850	\$2,100		\$1,800
AT Model 330	82,200	\$3,000		\$1,800
PS/2 Model 30	81,475	\$1,700		\$1,200
PS/2 Model 50	82,350	\$2,600		\$1,900
Compaq 386	82,000	\$2,700		\$2,000
Apple Macintosh 512	8650	\$775		\$650
512E	8875	\$975		\$600
Plus	81,125	\$1,225		\$1,000
II	84,300	\$5,100		\$3,800
NeXT	82,000	\$2,700		\$2,000
HP LaserJet	82,300	\$2,325		\$2,100

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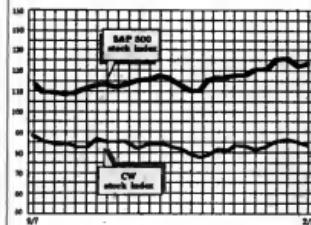
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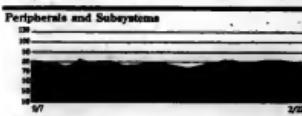
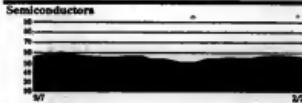
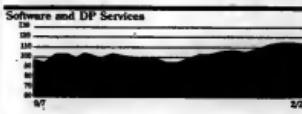
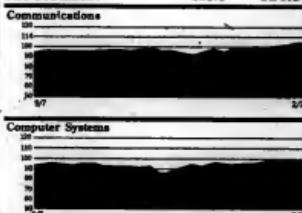




## STOCK TRADING INDEX



<i>Index</i>	<i>Last</i>	<i>High</i>	<i>Low</i>
Communications	104.7	103.7	103.7
Computer Systems	98.9	98.6	98.6
Software & DP Services	113.7	112.2	112.2
Semiconductors	57.7	56.5	56.5
Peripherals & Subsystems	80.0	77.9	77.9
Leasing Companies	94.2	94.6	94.6
Composite Index	85.4	84.4	84.4
S&P 500 Index	123.0	124.8	124.8



## Computerworld Stock Trading Summary

CLASSICAL AND QUANTUM PHYSICS

10-4000  
PANCAKE  
10

## Semiconductors

Perinatal

### Lending Companies

AMPLICON INC	20	10	10	-4.4	-1.8
CAPITAL ADDRESSES INTER-					
NATIONAL INC	7	4	8,200	0.8	3.8
COMMODITY INC	20	10	20,761	-0.8	-3.1
CONTINENTAL INFO SVCS	8	5	1,000	-0.1	-1.2
LED COMMUNICATIONS	20	10	18,770	-0.1	-2.0
TELECOM AWARE INC	20	10	2,000	0.1	2.0
REFLECTIVE INC	20	10	5,375	0.1	2.0

## Meltdown

*Midwinter meanderings lead  
shares to a seasonal slump*

The annual case of the blather that tends to make the rounds of offices, schools and other gathering places in February made its rounds this March visited the technology corner of the stock market last week, IBM, which slipped 4% of a point to start the week at 12554, dropped another 114 points to close Thursday at 12354. Digital Equipment Corp., however, soon bounced back from a midmorning skimp, fell 4% of a point to close Thursday at 11544.

Cullen Software, Inc., already losing ground as it warned of its 11th consecutive quarterly net loss, dropped farther after announcing the actual numbers. Cullen closed Thursday at \$14, down 14 of a point.

A spring-like note in the winter landscape was struck, however, by Data General Corp. Previews of its big RISC gamble, a Motorola, Inc., 88000-powered workstation series, piqued interest in the much-battered mini-computer maker. Data General stock climbed 14¢ of a point to end the week at 1914.

# Five join in low-cost Unix effort

BY WILLIAM BRANDEL  
OF STAFF

Marking Unix's 20th anniversary, five major minicomputer and software vendors will launch a fully functional, low-cost Unix software package for Intel Corp. 80386-based systems to undercut comparable offerings from the company that made Unix popular — Sun Microsystems, Inc.

Digital Equipment Corp., The Santa Cruz Operation (SCO), Relational Technology, Inc., Tandy Corp. and Lucas Computing Corp. reportedly plan to make their announcement tomorrow at a conference in November 1989 in San Francisco. The package will be called Open Desktop, sources briefed on the event said.

The package will include a 386-based system from Tandy; DEC's graphical programming interface, XUI; SCO's latest version of AT&T's Unix System V, Release 3.2; Relational Technology's DBMS/386; and Lucas' Merge.

Excluding the Tandy machine, the package's license will cost \$995 for two users and an additional \$500 for an upgrade to support three or more users, sources said.

**Marking contributions**  
A DEC spokesman confirmed the arrangement, stating that DEC would not be selling the package but will offer its XUI as a technological contribution.

The companies are merging their product offerings in an effort to standardize personal computer software for 386-based systems.

In addition to the products listed, the package will support industry standards including X Window System, Sun's Network File System, Transmission Control Protocol/Internet Protocol and the Open Software Foundation's standard user interface when it becomes available.

"Sounds like a damned good deal to me," said Tim Rudolph, senior systems engineer at Hanscom Air Force Base in Bedford, Mass. "The price-point is intriguing. If I had \$10,000, I'd buy one myself."

Sources said the package is being targeted at the government and scientific markets. The software will run on any 386-based PC and will require a 100MB hard disk and at least 16MB of memory. The package's total cost will be approximately \$9,000. A comparable system from Sun would reportedly range in price from \$15,000 to \$20,000.

# IBM's 'open' vow questionable

## ANALYSIS

BY AMY CORTESE  
OF STAFF

A year after IBM placed its AIX on a pedestal next to Systems Application Architecture (SAA), questions regarding the equality of the two product lines still persist.

Since modifying its long-held proprietary views and officially acknowledging its choice of Unix as a strategic product at UnixForum '88, IBM has gone to great lengths to prove it is serious about Unix and open systems. The marketing giant created a division dedicated to AIX and won its biggest endorsement from the Open Software Foundation, which will base its candidate for an industry-standard Unix operating system on AIX.

On the downside, IBM's disclosure comes this month that it will be late with AIX/370, anticipated possible trouble in bringing AIX to the mainframe. Its RT workstation has yet to command acceptance in the market.

While some observers say IBM will be a success in the Unix world simply because it is IBM, others are not so sure.

IBM has gone to great lengths to prove its commitment to Unix, but many still call it a shotgun wedding. "Proprietary systems will always be IBM's systems of choice," contended Bob Djuricic, president of Annex Research in Phoenix, Ariz.

While analysts debate the potential demand for mainframe Unix, AIX/370 is a real consideration for some customers, Carl Bond, vice-president of information

systems at Farm Bureau Mutual Insurance of Michigan, has installed IBM RTs at all of his insurance agencies and plans to eventually link them to a central host processor — possibly an IBM mainframe running AIX. So far, he said, he is satisfied with AIX and indications of IBM's continued commitment.

"IBM will be quite a major player in the Unix market," said Judith Harwitz, senior editor at Patricia Seybold's Computer Group in Boston. Harwitz cited the commercial appeal of AIX features such as disk mirroring and — even though it is not the main focus of IBM — "While other vendors will have to beg and plead with software developers to port applications," she said, "everyone will be writing for AIX."

Harwitz said the foreseen AIX playing an interesting role from the Open Software Foundation, which will base its candidate for an industry-standard Unix operating system on AIX.

On the downside, IBM's disclosure comes this month that it will be late with AIX/370, anticipated possible trouble in bringing AIX to the mainframe. Its RT workstation has yet to command acceptance in the market.

A mixed AIX family spanning operations from the desktop to the mainframe is at the core of IBM's AIX strategy. However, most analysts deplored the significance of IBM's postponed mainframe AIX offering.

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systems at Farm Bureau Mutual Insurance of Michigan, has installed IBM RTs at all of his insurance agencies and plans to eventually link them to a central host processor — possibly an IBM mainframe running AIX. So far, he said, he is satisfied with AIX and indications of IBM's continued commitment.

**W**HILE SOME observers say IBM will be a success in the Unix world simply because it is IBM, others are not so sure.

Harwitz said she does not think that IBM's delay of AIX/370 signals major problems. Since AIX was developed for the RT, there are many changes required to port it to the mainframe. "IBM has leverage no one else has — they can afford to do a few months late," she said. "For another company, that would be disastrous."

David Card, an analyst at Pragma Data, a Mass.-based market research firm international Data Corp., suggested that AIX/370 was delayed because it was not a priority for IBM. "There is not much demand for AIX/370. Unix is really a low-end market right now," he said.

However, Djuricic argued

that the opportunity cost for IBM will be significant. Amdahl already has a foothold in the midrange Unix market, and Unix is helping the IBM-compatible vendor sell mainframes, especially in Europe, he said.

Amdahl Corp.'s latest release of UTS, its version of Unix, is scheduled for third-quarter availability. Unlike AIX, which runs as a guest operating system under VM, UTS runs natively and therefore achieves better performance.

Djuricic contended that there is no room at issue for IBM than Unix. Unix is a new application area for the 9370, and IBM was counting on that to spark sales of the midrange mainframe, he said.

In the near term, IBM's biggest challenge may be to provide a powerful family of workstations. RT enhancements are slated for this year, but a significantly improved follow-on is anticipated in 1990 or 1991.

John Logan, vice-president at market research firm Aberdeen Group in Cambridge, Mass., does not see IBM becoming a major Unix force. While he said he views AIX as a "world-class product," the problem is the implementation of IBM's hardware platform and lack of corporate-wide commitment to AIX. Comparing IBM's RT success with other Unix vendors, he said, "It looks like IBM will be all alone in all classes."

As Logan summed it up, "The final cruel irony may be that AIX succeeds in the form of OSF, while IBM has little market presence in its own name."

about applications portability," he said.

He added that the high-end processors give him confidence that he will not be dead-ended in the midrange. Furthermore, he said, because of MS-DOS, microcomputer users in distributed networks can file almost like using a local-area network.

Unisys also introduced Decnet Interconnect, a software package that allows mainframe processors to connect to Digital Equipment Corp.'s proprietary Decnet networks. Set to be available between April and June, prices for the systems will range from \$2,000 to \$4,000.

Unisys added IBM Token Ring capability to its PCI software, which allows IBM Personal Computers and compatibles running MS-DOS to share files, applications and resources with a central data repository maintained on a U 6000/30 processor.

Already a user of the U 6000/30, Unisys will place the new software in late March. "With the systems, we will be able to distribute programs to local sites and upload data to the main office without worrying

# Unisys U series casts shadow in Unix arena

BY ROBERT MORAN  
OF STAFF

In the midst of layoffs last week, Unisys Corp. broadened its Unix-based offerings with three new models in its midrange U series. Analysts viewed the announcement — together with the formation of a Unisys Network Computing Group (NCG) and the branding of its systems as X/Open compatible — as the company's signal that it will become a major force in the commercial Unix market.

Unisys now offers Unix-based systems that span the gap from the desktop to multiprocessors. The X/Open branding ensures that the systems will comply with the Common Applications Environment specification by the X/Open Computer Ltd.

"Unisys has quickly become a formidable player in the Unix market through its OEM strategy," said Peter Kastner, vice-president of Aberdeen Group, a

market research firm in Boston. "They can now address anybody's requirements at a competitive price."

Unisys' largest growth area has been its Unix-based systems, said Robert Cameron, an analyst at Datapace, Inc. in Burlingame, Mass. "By creating the Network Computing Group, Unisys has isolated its best performers into one successful group." The tactic, he said, "inadvertently points out failures in the company's other lines of business."

Indeed, while touting the \$800 million in revenue that the company garnered from Unix last year, Paul Fidell, president of the new group, said that companywide layoffs (see story page 103) will affect the NCG. Although Fidell would not be specific, he said the layoffs would be less severe within the new organization.

The two largest models, the U 6000/70 and the U 6000/80, come to Unisys through an OEM

arrangement with Sequent Computer Systems, Inc. in Beaverton, Ore. Stated to become available in July, the U 6000/70 will cost from \$110,000 to \$400,000. The U 6000/80 will cost from \$195,000 to \$1 million and will support up to 400 users.

The entry-level U 6000/30 will be available by December. The U 6000/30 can support up to 16 users. Available immediately, its price ranges from \$11,000 to \$30,000.

The new models, together with the company's older U 6000/50, are based on Intel Corp.'s 80386 processors and run software based on AT&T's Unix System V and MS-DOS.

**From here to there**  
Clifford Rushton, manager of data processing at the federal products division of the Federal Paper Board Co. in Augusta, Ga., has ordered 20 U 6000/30s.

Already a user of the U 6000/30, Rushton will place the new software in late March. "With the systems, we will be able to distribute programs to local sites and upload data to the main office without worrying

about applications portability," he said.

Unisys also announced that U series successors can now run Sun Microsystems, Inc.'s Network File System, which will range from \$3,500 to \$9,000.

# Sun heats up Sparc strategy

**Low- and high-end workstations bolster Sun's line to counter DEC threat**

BY JULIE PITTA  
CW STAFF

**MOUNTAIN VIEW, Calif.** — Sun Microsystems, Inc. will have a multi-tiered response to the increasing competitive pressure from reduced instruction set computers (RISC) systems this week with low-end and high-end workstations, according to sources briefed on the products.

Sun will introduce a workstation-based on its Scalable Processor Architecture (Sparc) running at 8 million instructions per second (MIPS) and priced at about \$7,000, the sources said. At the same time, Sun will unveil a high-end Sparc-based system offering 20 MIPS in processing speed. That system will be priced at about \$30,000.

A Wall Street analyst briefed on Sun's offerings said it is looking to expand its installed base with front-end units. "Sun

can go back into those sites and then sell them a high-end server with a hefty price tag," he said.

Sun is expected to show both systems privately to selected customers at the Uniform 1989 show in San Francisco. Company officials declined to comment on the systems.

#### RISC rivals

Industry watchers said the range of products in Sun's response to heated competition in the workstation market, especially the emergence of RISC-based systems from competitors such as Digital Equipment Corp.

Additionally, Sun will bolster its Motorola, Inc. processor-based line of workstations later this spring with a 68030-based system that costs about \$6,000, sources said.

An existing system in the Sparc line, the Sun 4/110, costs \$19,950 and runs at 7 MIPS.

The rollout of a low-end system will likely require that Sun make price adjustments.

Meanwhile, Sun is developing a Sparc system with a processing speed of between 40 and 50 MIPS, the sources said. That system, which will require a cool environment to run, is expected to be unveiled before the end of this year, they added.

According to industry watchers, Sun is looking to pull away from DEC, which began Apollo Computer, Inc. to become No. 2 in the workstation market last year.

"When Sun turns around, it's looking at DEC," said Jennifer Johnson, senior analyst of the technical market at Framingham, Mass.-based market research firm International Data Corp. "It's true that DEC has just introduced its first RISC machine, but it's clear they intend to fill out their line."

prediction depended on Motorola's chip being accepted as the RISC architecture for Apollo Computer, Inc.'s hardware. "If not, they'd end up with a rather distant third," she said.

**Motorola** is leveraging its RISC architecture through the consortium, while RISC rivals Sun Microsystems, Inc. and Mips Computer Systems, Inc. are using more informal software development channels — Sun through third parties and Mips through an independent software company that serves as an intermediary for third-party developers.

**Robert Cody**, director of S800m, said that Motorola is expected to be ahead of Sun and Mips in market share in 1993, according to research conducted by Santa Clara, Calif.-based Infocorp.

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"We'll use Open Software Foundation standards as appropriate," said Bob Amundson, executive director of S800m.

The consortium has developed RISC for Motorola's chips and has worked with AT&T to develop a Unix application binary interface, said Amundson, executive vice-president of Motorola.

The consortium's technical staff, Amundson explained, software software compliance to its standards and will issue its seal of approval for software that passes the certification program.

## Data General

CONTINUED FROM PAGE 1

family of minicomputers erodes.

"This is their future," said Judy Harwitz, a senior analyst at Patricia Seybold's Office Computing Group, a market research firm in Boston. "This is DG's first step toward a comprehensive switch-over to a full Unix strategy. They're essentially buying a new company from within."

The entry-level workstation is reportedly based on a 16-MHz 68000 chip and is capable of pro-

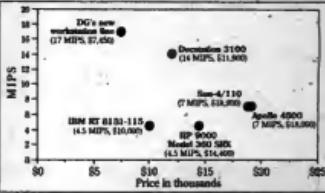
cessing, an analyst at D&P Philips Selected Utilities, Inc., a market research firm in Chicago.

One factor assisting this will be the machine's adherence to the S800m Consortium Ltd.'s binary compatibility standard (BCS). The BCS calls for all software written for any 88000-based computer to employ a common interface to executable or binary programs, thus allowing for compatibility across systems from many vendors.

Commercial users of the new line, including those in the financial, manufacturing, government and health care fields, will likely

#### One-upmanship

*In the battle to deliver the most MIPS for the fewest dollars, DG's announcement this week should top DEC's price/performance benchmarks established last month.*



need high-performance machines on their desktops.

Early assessors of the machines said they were impressed with the RISC technology at the low price. "We can't wait to get one," said Al Rocco, a spokesman at Westwood, Mass.-based Medical Information Technology, Inc., which has a network of 400 terminals attached to nine DG minicomputers. "Our network shows down as we add more terminals; the RISC machine should take care of that."

But some analysts say that lack of volume production of Motorola's chips will limit DG's ability to make a quick drive into the market. "They can make much of this because there aren't a lot of 88000 chip sets around to put the minicomputer into volume production," said John J. McNamee, vice-president of Thomson McKinnon Securities, Inc. in New York.

DG is also scheduled to introduce single- and dual-processor servers. The entry-level single-processor version will include 16M bytes of memory, offer 20 MIPS of processing power and sell for \$59,000. A dual-processor model will start at \$94,000. DG's rollout will be the plan in the batch of recent announcements by software developers so that applications can be ported to the new line. Analysts see this as key in helping DG establish a foothold in the market and secure new customers. "You can't sell a machine if you can't do anything with it," said P. Martin

## RISC software gets 88open thumbs-up

BY J. A. SAVAGE  
CW STAFF

**BURLINGAME, Calif.** — A 29-member consortium organized last year to promote Motorola, Inc.'s reduced instruction set computing (RISC) architecture announced 26 software packages last week to accompany the first RISC-based hardware products from Data General Corp., Sanyo Business Systems Corp. and Itron International, Inc.

Practically everyone involved in the consortium, including the RISC industry standard (BCS), the S800m Consortium Ltd., the Computerworld Consortium, and the 88open Consortium, has placed its seal of approval on the products, which range from operating systems (including Pick Systems' Pick) to compilers, relational databases and office automation.

Nearly all the products are scheduled for availability in late

1989, although DG and Sanyo are announcing hardware products that are expected this summer (see story page 1).

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## TRENDS

## Executive information systems

The executive of 1992 will be armed with the right information to make better, more informed decisions, a study conducted by International Data Corp. (IDC) suggests. The study shows that the use of executive information systems (EIS) is on the rise.

Executives surveyed by the Framingham, Mass.-based market research firm indicated that EIS is gaining importance and is increasingly needed.

EIS will be the fastest growing segment of the overall decision support system (DSS) market, IDC predicts.

DSS is in management problem solving by using techniques such as modeling, data management, forecasting, reporting and graphics.

EIS is targeted at high-level management and was designed to provide timely, pertinent information to aid in decision making, thereby eliminating the need to sift through lengthy reports.

According to IDC estimates, the EIS market will mushroom from just \$1 million in 1984 to \$115 million in 1992, outpacing other DSS areas such as financial modeling, spreadsheet and auxiliary and other application software.

However, the financial modeling category will also grow, retaining its status as the largest DSS submarket. The aggregate DSS market is predicted to grow to more than \$450 million by 1992.

EIS represented only 11% of the DSS market in 1987. By 1992, IDC predicts that it will make up a full quarter of that market.

EIS is still fairly new to many executives. While sales of EIS packages are reportedly mounting, they are slowly being put to use by busy executives. (See story, page 31).

An IDC survey of executive ratings of personal computer functions showed that executives still favor spreadsheets and financial modeling over EIS.

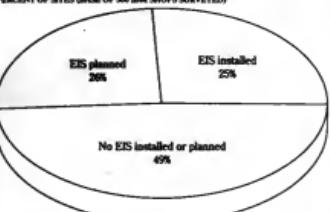
But advances in technology are making EIS easier for executives to use and learn, which should speed the technology's adoption.

EIS bright future is further evidenced in a forthcoming IDC survey of 500 IBM sites, in which slightly more than half of the respondents indicated that they had EIS installed or that they planned to install such systems.

AMY CORTESE

## Many users planning for EIS

PERCENT OF SITES (BASE OF 500 IBM SITES SURVEYED)

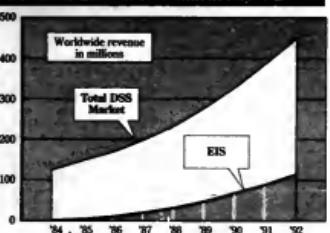


## Outlook appears positive

NUMBER OF RESPONSES (BASE OF 48 FIRMS SURVEYED THAT USE OR PLAN DSS)

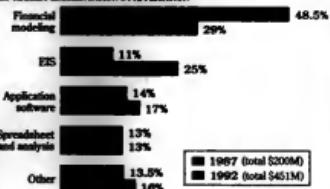


## EIS to be 25% of DSS market by '92



## Dollars will rival financial modeling

DSS MARKET SEGMENTATION BY APPLICATION



SOURCE: INTERNATIONAL DATA CORP.  
CW CHARTS JOHN YORK

## INSIDE LINES

The winds are blowing around DEC . . . and people that are leaning trees may find their shelter blown down. That was the line Ken Olsen delivered during a mid-Polycom product marketing conference, according to reports filtering down through DEC. The major corporate god, according to the Decipher, is financial growth of 20% annually, no employment growth and price-cutting of 20% during the next three years. Among other tidbits making the rounds: Olsen, catching up to opinion outside the company, seemed unimpressed by DEC's marketing efforts and wants "innovation, leadership and aggressiveness." DEC will develop a strategy to educate the Big Eight accounting firms about DEC products; and VME can be ported to a reduced instruction set computing (RISC)-based VAX.

We'll withhold judgment. A DEC official related last week's inside lines item that DEC was negotiating with Tandy Corp. to build a Micro Channel-based PC. However, the source of the information maintains that the DEC official made the statement, adding that "DEC did not want to close out its customer from Micro Channel products."

Server server confusion. Is it partnership deal with Microsoft and Sybase, Autodesk-Tandem or is it reportedly planned from selling yet another database management system other than the SQL Server all three are developing. But that will not stop Autodesk from hedging its bets by supporting a server from Interbase, in which it has an equity stake. The deal will be distributed by Cognex.

A Novell approach for Gupta. Today, Novell and Gupta Technologies are expected to announce a joint marketing and technology agreement that will give Novell a two-pronged database strategy. For users who wish to run DBMS software on a nondedicated file server, Novell will pack its own Netware SQL, XML and Strixware. For those opting for a dedicated database server, Novell will offer up Gupta's SQL Server, a more robust server system. The move is seen as aimed squarely at Microsoft, which is pushing its own SQL Server and LAN Manager operating system.

For whom the bell tolls. Sources close to DEC say the firm will officially notice the Vesuvium RISC chip on March 31. The workstation was introduced in January 1986 and was the first workstation in the industry to use MIT's X Window System. A DEC spokesman and the move would not surprise him, as it is slowdown in price/performance by the Vesuvium \$160, \$320 and \$660 models.

Privileged partner? Although IBM is late with AIX/370 for its customers, that does not affect the Open Software Foundation, says OSF Chairman David Tracy. The OSF is using AIX as the core product for its alternative to an AT&T-standard Unix, and Tracy said the original schedule is being met by IBM. The OSF has been receiving AIX Release 2 code and expects to receive Release 3 code in March.

Spotting Spores. The consortium of chip vendors to promote Sun Microsystems' Scalable Processor Architecture (Sparc) has been incorporated. Sparc International, Inc. will be led by Cypress Semiconductor's Roger Rose, who also pioneered Motorola's 68030 efforts before joining Cypress. According to Cypress' chief executive, T. J. Rodgers, Sparc International has been awarded the legal right to use the Sparc name. The next step is to ensure compatibility between all available variations of Sparc and the Unix operating system, Rodgers said. Sparc International is also composed of representatives from Fujitsu, Texas Instruments, LSI Logic and Digital Integrator Technology.

Will the wild IBM Celeron surface in the LAN market? Public offerings for high-tech companies have piled since Seattle WA's note made a billion-dollar by Wall Street, but Network General Corp., owner of the Sniffer diagnostic package, says it plans \$25 million public offering to bid up to \$200 million by investors. With that and IBM's buy into ICCom, it would be interesting. Will that be the last story in the Journal to start writing about LANs? But if you want to see the story straight, give these tips to News Editor Paul Rutherford by calling our hot-line at 800-345-6474 or 503-279-0700.

# THIS IS NO PLACE FOR SPACE INVADERS.



A business desk is no place to play games with space. So NEC built three serious machines with one mission in mind: optimum performance in a minimum space. Meet PowerMate® 1, PowerMate 1 Plus and PowerMate SX.

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